

**FINAL
ACTION MEMORANDUM
NON-TIME-CRITICAL REMOVAL ACTION
IRP SITE 5, WETLANDS SEDIMENT
NAVAL BASE VENTURY COUNTY
POINT MUGU, CALIFORNIA**

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ACRONYMS/ABBREVIATIONS

| | |
|-----------------|-----------------------------------------------------------------------|
| AOEC | area of ecological concern |
| ARAR | applicable or relevant and appropriate requirement |
| ATSDR | Agency for Toxic Substances and Disease Registry |
| bcy | bank cubic yards |
| BEI | Bechtel Environmental, Inc. |
| Cal. Code Regs. | California Code of Regulations |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| COC | chemical of concern |
| COPC | chemical of potential concern |
| CWA | Clean Water Act |
| DDD | dichlorodiphenyldichloroethane |
| DDE | dichlorodiphenyldichloroethene |
| DDT | dichlorodiphenyltrichloroethane |
| div. | division |
| DoD | Department of Defense |
| DON | Department of the Navy |
| DTSC | Department of Toxic Substances Control |
| EE/CA | engineering evaluation/cost analysis |
| EK | electrokinetic |
| ERA | ecological risk assessment |
| ERM | effects-range median |
| Fed. Reg. | Federal Register |
| HMW | high molecular weight |
| HQ | hazard quotient |
| IAS | initial assessment study |
| IRP | Installation Restoration Program |
| INRMP | Integrated Natural Resource Management Plan |
| JMM | James M. Montgomery Engineers, Inc |
| mg/kg | milligrams per kilogram |
| NAS | Naval Air Station |
| NAWS | Naval Air Weapons Station |
| NBVC | Naval Base Ventura County |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |

| | |
|------------------------------|---------------------------------------------------|
| NPL | National Priorities List |
| NTCRA | non-time critical removal action |
| ORNL | Oak Ridge National Laboratory |
| PAH | polynuclear aromatic hydrocarbon |
| PRC | PRC Environmental Management, Inc |
| pt. | part |
| RACER | Remedial Action Cost Engineering and Requirements |
| RCRA | Resource Conservation and Recovery Act |
| RI | remedial investigation |
| RWQCB | Regional Water Quality Control Board |
| § | section |
| SCS and Landau Associates | Stearns, Conrad, Schmidt and Landau Associates |
| tit. | title |
| TRV | toxicity reference value |
| U.S. EPA | United States Environmental Protection Agency |
| UCL | upper confidence limit |
| U.S.C. | United States Code |
| VCAPCD | Ventura County Air Pollution Control District |

ACTION MEMORANDUM

**Naval Base Ventura County
Point Mugu, California**

DATE: October 4, 2010

SUBJ: ACTION MEMORANDUM FOR REMOVAL ACTION AT THE
INSTALLATION RESTORATION PROGRAM SITE 5, WETLANDS
SEDEIMENT, NAVAL BASE VENTURA COUNTY, POINT MUGU,
CALIFORNIA

Site Status: Non-National Priorities List

Category of Removal: Non-Time Critical Removal Action

CERCLA ID: CA9170027271

Site ID: IRP Site 5

1 PURPOSE

The purpose of this Action Memorandum is to document, for the Administrative Record, the Department of the Navy's (DON's) decision to undertake a non-time-critical removal action (NTCRA) for removal of chemicals of concern (COCs) i.e., cadmium-, chromium-, copper-, lead-, nickel-, and silver-impacted sediment at Installation Restoration Program (IRP) Site 5, the Old Area 6 Shops, located on Naval Base Ventura County (NBVC), Point Mugu, California. The Department of Defense (DoD) has the authority to undertake Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response actions, including removal actions, under 42 United States Code (U.S.C.) Section (§) 9604, 10 U.S.C. § 2705, and federal Executive Order 12580 as amended.

The NTCRA will include excavation of COC-impacted sediment, dewatering and chemical profiling of the excavated sediment, loading and transporting the impacted sediment to the landfill(s), and backfilling the excavation with clean sediment at IRP Site 5. The Navy in cooperation with the California Department of Fish and Game will reconstitute the excavated areas to pre-existing wetland habitat. The backfill will be designed and constructed with clean sediment similar to the physical composition of the surrounding sediment bed, with the intent that the wetland ecological community would recolonize the excavated area. By doing this, the selected action will substantially eliminate the identified pathways of exposure to hazardous substances and contaminants of concern for the receptors (birds; i.e., song sparrow and light-footed clapper rail which is a special-status species; and small mammals; i.e., deer mouse). This NTCRA is anticipated to be an interim step until the acceptable levels have been defined and the results of this removal action can be compared to those levels. If sediment concentrations in portions or all of the removal action area do not meet the acceptable levels, further removal action may be required.

The Removal Action for this site is deemed consistent with the factors set forth within the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part (pt.) 300, based on the findings of 300.415(b)(2)(i) and (iv) of the NCP. These findings are discussed in more detail in Section 3.

There are not any nationally significant or precedent-setting issues for this site.

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2 SITE CONDITIONS AND BACKGROUND

This section presents the description, location, and background for IRP Site 5, located on NBVC Point Mugu and the physical characteristics and past releases from the site, as well as the site regulatory status and current/previous actions.

2.1 SITE DESCRIPTION

IRP Site 5 is located just west of Laguna Road on a sand spit separating Mugu Lagoon and the Pacific Ocean. Between 1947 and 1978, wastes associated with laboratory and shop operations were disposed at IRP Site 5. Documented discharge locations included a slough, located just north of Beach Road across from Building 6-31, and former plating-waste pits. Table B-1 (all tables are presented in Appendix B) shows the probable origins of wastes, waste types, estimated amounts, discharge/disposal locations (when documented), and periods of disposal. In addition, an 8-inch sewer effluent line running north-south through the eastern portion of IRP Site 5 was discovered during a 1991 site visit by PRC Environmental Management, Inc (PRC). The effluent material was historically discharged to Mugu Lagoon; the origin of the line has not been identified with certainty (PRC and JMM 1993).

2.1.1 Removal Site Evaluation

IRP Site 5 has been investigated as a part of a number of station-wide and site-specific environmental investigations. These investigations include a Initial Assessment Study (IAS) (SCS and Landau Associates 1985), Site Inspection Study (Fugro-McClelland 1991), Phase I Remedial Investigation (RI) (TtEMI 2000), Emergency Removal Action (PRC 1995), Basewide Groundwater RI (TtEMI 2002), Electrokinetic (EK) Pilot Study (TN&A 2003), Screening-Level Ecological Risk Assessment (ERA) (TtEMI 2001), Phase II RI (Battelle 2002), Final ERA Addendum (TtEMI 2005), Decommissioning of the EK Pilot Study (TN&A 2004), Phase II Groundwater RI (BEI 2005), and Feasibility Study (BEI 2008).

Based on analytical results from previous investigations, residual or confirmation sampling results, reported excavation limits of the emergency removal action, and the EK pilot study decommissioning effort, it has been determined that the current site COCs concentrations based on 95 percent upper confidence limit (UCL) of the mean exceeding the sediment management objectives (SMOs) of 7.56 milligrams per kilogram (mg/kg) for cadmium, 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively, remains at some sampling locations. These sampling locations are near the former plating-waste pits, within approximately 100 feet of the EK decommissioning excavation, and the area encompassing these sampling locations is designated as area of ecological concern (AOEC) 1.

Based on the results of the ERA Addendum (TtEMI 2005), the elevated chromium concentrations at IRP Site 5 pose significant or immediate risk to the song sparrow and light-footed clapper rail, a special-status species. In addition, the elevated cadmium concentrations at IRP Site 5 also pose significant or immediate risk to the light-footed clapper rail. Ecological risks from media other than sediment and chemicals of potential concern other than cadmium and chromium, ecological risk to receptors other than the light-footed clapper rail and the song sparrow, and risks to human health were determined not to warrant further action

(TtEMI 2000, 2005; BEI 2005). However, subsequent to the issuance of the Draft Engineering Evaluation/Cost Analysis (EE/CA) Report (Insight and Earth Tech, Inc. 2007), regulators requested that copper, lead, nickel, and silver be addressed in addition to cadmium and chromium and that removal goals and alternatives presented in the EE/CA be protective of small mammals in addition to birds.

It was noted that the IRP Site 5 ecological risk assessments did not include data from some of the most contaminated areas because at the time the former plating-waste pits were covered with hardware cloth and a complete exposure pathway did not exist. Therefore, given the potential of exposing on-site receptors to elevated COC concentrations, a response that either eliminates or minimizes the exposure is required for sediment at IRP Site 5.

2.1.2 Physical Location

NBVC Point Mugu is located in Point Mugu, Ventura County, California, approximately 50 miles northwest of Los Angeles (Figure A-1) (all figures are presented in Appendix A). NBVC Point Mugu is bordered by Highway 1 on the north and east, the Pacific Ocean on the south and west, and two game reserves on the west and northwest (Figure A-2). IRP Site 5 is located just west of Laguna Road on a sand spit separating Mugu Lagoon and the Pacific Ocean (Figure A-3). The site is on the southern side of the western arm of Mugu Lagoon.

NBVC Point Mugu covers approximately 4,500 acres and supports 897 buildings, including 568 housing units. Many of the buildings were constructed on dredged material and other fill.

The Navy established temporary operations at Point Mugu in 1943 and has conducted operations there since 1944. In 1946, the Naval Air Missile Test Center was commissioned and in 1949, the United States Naval Air Station was commissioned. Congress appropriated funding for a permanent Navy site at Point Mugu in 1947. The Pacific Missile Test Range was established in 1957 and was renamed Pacific Missile Test Center in the mid-1970s. In 1993, the names were revised again; the Pacific Missile Test Center became Naval Air Warfare Center Weapons Division, and the U.S. Naval Air Station became Naval Air Weapons Station (NAWS) Point Mugu. In 1998, NAWS Point Mugu was renamed Naval Air Station (NAS) Point Mugu. As part of regionalization of Ventura County's naval bases, Naval Construction Battalion Center Point Hueneme and NAS Point Mugu were consolidated administratively under NBVC on 01 October 2000. The aviation mission and base operating support were consolidated under the NBVC command (TtEMI 2000). On 16 October 2006, NAS Point Mugu was renamed NBVC Point Mugu.

The primary mission of NBVC Point Mugu is to serve as a major center for testing and evaluating naval weapons systems and also to provide range, technical, and base support for fleet users and other DoD agencies. NBVC Point Mugu currently maintains a fleet of over 50 aircraft, many of which are uniquely configured to support the assigned Test and Evaluation mission for airborne weapons and electronic warfare systems. Aircraft are also used for mobile range instrumentation, range surveillance and clearance, target launch and recovery, and logistics support. NBVC Point Mugu maintains the Navy's largest and most varied inventory of airborne targets. The base also provides target support for the Mobile Sea Range operation around the

Section 2 Site Conditions and Background

world. Support for other test ranges that require sophisticated threat-simulation support is also provided upon request (TtEMI 2000).

The climate in the NBVC Point Mugu area is moderately humid with mild, moist winters and warm, dry summers. Because the base is located adjacent to the Pacific Ocean, its climate is moderated by the effects of shore breezes. The average annual precipitation in the area is approximately 14.82 inches with a mean monthly precipitation ranging from 0.02 inch in June to 3.36 inches in February (Western Regional Climate Center 2001). The precipitation occurs mostly in the months from November through April. There are four office trailers and one storage building in the portion of IRP Site 5 south of Beach Road. Most of the site north of Beach Road consists of salt marsh, tidal creek channels, and intertidal mudflats. This area of the site is currently used as a wildlife refuge and is anticipated to be used as a wildlife refuge in the future.

2.1.3 Site Characteristics

IRP Site 5 consists of two distinct areas separated by Beach Road (Figure A-3). The portion of IRP Site 5 south of Beach Road is used by base office personnel and contains four office trailers and one storage building. There are no plans at this time to change the use of the existing trailers and building or construct new buildings. The ground surface south of Beach Road consists of pavement interspersed with nonnative grassland habitat.

Most of the site north of Beach Road consists of salt marsh, tidal creek channels, and intertidal mudflats. This area of the site is currently used as a wildlife refuge and is anticipated to be used as a wildlife refuge in the future. Buildings have not been and will not be constructed on the wetland portion of the site. The former plating-waste pits were located north of Beach Road in this area. A tidal creek originating at Mugu Lagoon cuts through the northern half of the site. An east-west power-line service track transects the northern half of IRP Site 5, obstructing surface water flow except where the tidal creek passes under the track through a pair of culverts.

As discussed in Section 2.2.1, between 1985 and the present, several investigations and removal actions have been conducted at IRP Site 5, which are briefly summarized in Table B-2.

2.1.4 Release or Threatened Release into the Environment of a Hazardous Substance or Pollutant or Contaminant

As discussed in Section 2.1.1, COC concentrations (based on 95 percent UCL of the mean) exceeding the SMOs remains at some sampling locations near the former plating-waste pits, within approximately 100 feet of the EK decommissioning excavation. Sample locations and analytical results are shown in Figure A-4. Based on the results of the ERA Addendum (TtEMI 2005), the elevated chromium concentrations at IRP Site 5 pose significant or immediate risk to the song sparrow and light-footed clapper rail, a special-status species. In addition, the elevated cadmium concentrations at IRP Site 5 also pose significant or immediate risk to the light-footed clapper rail. Ecological risks from media other than sediment and chemicals of potential concern other than cadmium and chromium, ecological risk to receptors other than the light-footed clapper rail and the song sparrow, and risks to human health were determined not to warrant further action (TtEMI 2000, 2005; BEI 2005). However, subsequent to the issuance of the Draft EE/CA Report (Insight and Earth Tech, Inc. 2007), regulators requested that copper,

lead, nickel, and silver be addressed in addition to cadmium and chromium and that removal goals and alternatives presented in the EE/CA be protective of small mammals in addition to birds. Therefore, given the potential of exposing on-site receptors to elevated COC concentrations, a response that either eliminates or minimizes the exposure is required for sediment at IRP Site 5.

Currently there is a potential for redistribution of COC-impacted sediment from the IRP Site 5 by bioturbation by burrowing organisms and a potential for migration of COC-impacted sediment by surface water runoff.

The primary exposure pathways by which the potential receptors (birds i.e., song sparrow and light-footed clapper rail; and small mammals i.e., deer mouse) may come in contact with the COC-impacted sediment at IRP Site 5 include ingestion of sediment and ingestion of prey that has accumulated the impacted sediment.

2.1.5 National Priorities List Status

NBVC Point Mugu is not a National Priorities List (NPL) site and has not been proposed for inclusion on the NPL. In addition, the site has not received a Hazard Ranking System rating and is not being evaluated for the Agency for Toxic Substances and Disease Registry.

2.1.6 Maps, Pictures and Other Graphical Representations

The following figures are presented in Appendix A of this report:

- Figure A-1: Project Location Map
- Figure A-2: Facility Location Map
- Figure A-3: Site Location Map
- Figure A-4: Results Exceeding the Sediment Management Objectives, Current Conditions
- Figure A-5: Removal Action Area
- Figure A-6: Project Schedule

The following tables are presented in Appendix B of this report:

- Table B-1: Waste Generation and Handling Summary
- Table B-2: Summary of Previous Investigations
- Table B-3: Hazard Quotients for Upland Habitat Species From the Screening-Level ERA
- Table B-4: Hazard Quotients for Salt Marsh and Tidal Creek Species From the Screening-Level ERA
- Table B-5: Chemicals Identified for Further Evaluation by the Screening-Level ERA
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- Table B-8: Hazard Quotients for Light-Footed Clapper Rail from the ERA Addendum
- Table B-9: Hazard Quotients for Surf Scoter from the ERA Addendum
- Table B-10: Estimated Costs for Alternative 3
- Table B-11: Assumptions/Parameters for Cost Estimation of Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal

2.2 OTHER ACTIONS TO DATE

2.2.1 Previous Actions

Between 1985 and the present, several investigations and removal actions have been conducted at IRP Site 5. These are briefly summarized in Table B-2.

2.2.2 Current Actions

Currently, the remedial action evaluation process is ongoing at IRP Site 5. The Record of Decision will be finalized for IRP Site 5 after completion of the NTCRA.

2.3 REGULATORY AUTHORITIES ROLES

This section discusses the roles of regulatory agencies with potential involvement in the removal action for IRP Site 5. As provided by CERCLA, the NCP, and Executive Order 12580, the DON is the CERCLA lead federal agency for the selection and implementation of this removal action. In August 1999, as the lead federal agency, the DON entered into a Federal Facilities Site Remediation Agreement with the State of California (DON 1999). This agreement provides Department of Toxic Substances Control (DTSC) with an opportunity to review and concur with the Site Management Plan and other documents related to DON's site restoration projects. As such, DTSC is the lead state regulatory oversight agency at IRP Site 5, along with the Regional Water Quality Control Board (RWQCB), Los Angeles Region, and U.S. Environmental Protection Agency (EPA) which also maintain active lead roles in environmental decisions at the base. In addition, the DON is working in cooperation with California Department of Fish and Game through DTSC to implement this action. The DTSC has conducted its own independent environmental assessment on the potential environmental impact of this project in accordance with the California Environmental Quality Act (California Public Resources Code, Section 21000, et seq.). The Notice of Exemption is provided in Appendix C documenting the DTSC's approval of the selected removal action under General Rule [Section 15061 (b) (3)] which determined that the project will not have potential for a significant impact on the environment.

2.3.1 Regulatory Agency Actions to Date

The U.S. EPA, California EPA, DTSC, and RWQCB have provided technical advice, oversight, and assistance during the previous investigations, the development of the EE/CA (Appendix D), and this NTCRA Action Memorandum.

2.3.2 Potential for Continued Regulatory Agency Response

The U.S. EPA, California EPA, DTSC, and the RWQCB Los Angeles Region have provided technical advice and oversight and assistance during this removal action and will continue to do

so throughout the Installation Restoration process. It is expected that the DON's Defense Environmental Restoration Program account funds will continue to be the exclusive source of funding for this program.

3 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

In accordance with the 1990 NCP, the following threats must be considered in determining the appropriateness of a removal action (40 CFR § 300.415(b)(2)):

- Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains;
- Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;
- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate;
- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;
- Threat of fire or explosion;
- The availability of other appropriate federal or state response mechanisms to respond to the release; and
- Other situations or factors that may pose threats to public health or welfare or the environment.

3.1 THREATS TO PUBLIC HEALTH OR WELFARE

There are no threats to public health or welfare for this site.

3.2 THREATS TO THE ENVIRONMENT

Threats to the environment that apply to conditions at the IRP Site 5 include:

- Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby animals or food chains.
- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

As discussed in Section 2.1.4, the COCs at IRP Site 5 include cadmium, chromium, copper, lead, nickel, and silver. The primary exposure pathway by which the potential receptors (birds i.e., song sparrow and light-footed clapper rail; and small mammals i.e., deer mouse) may come in contact with the COC-impacted sediment at IRP Site 5 includes ingestion of sediment and ingestion of prey that has accumulated in the impacted sediment.

Animals given cadmium in food or water had high blood pressure, iron-poor blood, liver disease, and nerve or brain damage (ATSDR 1999a). Animal studies for chromium have also shown an increased risk of cancer (ATSDR 2000). Studies in animals suggest that high levels of copper may cause a decrease in fetal growth (ATSDR 2004). Animal studies have found increases in newborn deaths and decreased newborn weight after ingesting very high amounts of nickel (ATSDR 2005). Animal studies have shown that swallowing silver results in the deposit of silver in the skin (ATSDR 1999b).

Currently there is a potential for redistribution of COC-impacted sediment from the IRP Site 5 by bioturbation by burrowing organisms and a potential for migration of COC-impacted sediment by surface water runoff.

3.2.1 Risk Evaluation

The concentrations of COCs exceeding the SMOs in IRP Site 5 sediment samples are presented on Figure A-4. The area with the highest concentrations of COCs is located near the former plating-waste pits, within 100 feet of the EK decommissioning excavation footprint.

Based on the results of the ERA Addendum (TtEMI 2005), the elevated chromium concentrations at IRP Site 5 pose significant or immediate risk to the song sparrow and light-footed clapper rail, a special-status species. In addition, the elevated cadmium concentrations at IRP Site 5 also pose significant or immediate risk to the light-footed clapper rail. Subsequent to the issuance of the Draft EE/CA Report (Insight and Earth Tech, Inc. 2007), regulators requested that copper, lead, nickel, and silver be addressed in addition to cadmium and chromium and that removal goals and alternatives presented in the EE/CA be protective of small mammals in addition to birds. Therefore, given the potential of exposing on-site receptors to elevated COC concentrations, a response that either eliminates or minimizes the exposure is required for sediment at IRP Site 5. These potential threats to the environment will be addressed by the selected action described in this Action Memorandum.

The remainder of this section provides a summary of risk evaluation including exposure pathways, potential receptors and potential risks to the environment.

3.2.1.1 EXPOSURE ASSESSMENT

Cadmium, chromium, copper, lead, nickel, and silver were considered as the only COCs at the IRP Site 5. Exposure to COCs was assumed to be mainly via the following exposure pathway:

- Incidental ingestion of COC-impacted sediment and prey.

The light-footed clapper rail, song sparrow, and deer mouse may also be exposed to IRP Site 5 sediment through dermal contact or inhalation; however, exposure by these pathways is assumed to be less significant to total exposure via ingestion and was not evaluated in the baseline ecological risk assessment.

The SMOs of 7.56 mg/kg for cadmium, 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, in IRP Site 5 wetland sediment

Section 3 Threats

are based on site-specific information and details for development of SMOs are presented in Appendix E of the Final Feasibility Study (BEI 2008).

3.2.1.2 *RISK CHARACTERIZATION*

Several ERAs have been conducted for IRP Site 5. The first, completed as part of the Phase I RI, consisted of a biological characterization of the site and a scoping assessment (TtEMI 2000). A screening-level ERA was then conducted to evaluate risk from concentrations of chemicals of potential concern (COPCs) to representative bird and mammalian receptors (TtEMI 2001). A Tier II ERA was performed that focused on evaluating the potential ecological risk from metals, dichlorodiphenyltrichloroethanes (DDTs), and Aroclors in the marsh sediment of IRP Site 5 (TtEMI 2005).

PHASE I RI

During the Phase I RI, an ERA for IRP Site 5 was performed that included a biological characterization of the site and a scoping assessment (TtEMI 2000). The biological characterization identified habitats present at the site using data collected on the vegetation, mammals, fish, and benthic invertebrates. In addition, a scoping assessment was performed that addressed potential receptors, exposure pathways, and identification of COPCs.

Biological Characterization

Data were collected to validate food chain models and support the selection of receptors for the ERA. Data on community characteristics at IRP Site 5 were obtained by conducting vegetation, benthic infauna and epifauna, mammal, and fish surveys. A compilation of the plant and animal species identified during the surveys is provided in the Phase I RI (TtEMI 2000).

Scoping Assessment

The scoping assessment evaluated the habitats and receptors that occur at IRP Site 5, the occurrence of COPCs, and the potential for ecological exposure in the upland, tidal marsh, and tidal creek areas of the site.

Conclusions

The Phase I RI identified antimony, chromium, copper, lead, nickel, silver, zinc, 4,4'-dichlorodiphenyldichloroethane (DDD), 4,4'-dichlorodiphenyldichloroethene (DDE), 4,4'-DDT, alpha-chlordane, gamma-chlordane, and Aroclor 1260 as COPCs for IRP Site 5. Based on the ERA, the Phase I RI recommended a Feasibility Study for COPCs in soil and sediment at IRP Site 5 and a groundwater assessment to evaluate the attenuation of COPCs at IRP Site 5 (TtEMI 2000).

VERTEBRATE TECHNICAL MEMORANDUM

The Vertebrate Technical Memorandum presented a screening-level ERA conducted for IRP Site 5 to evaluate risk from concentrations of COPCs to representative bird and mammalian receptors (TtEMI 2001). The screening-level ERA used comparison of site chemistry with toxicity benchmarks and a food chain modeling approach to evaluate potential risk. During food

chain modeling, site-specific doses were estimated and compared to toxicity reference values (TRVs) using a hazard quotient (HQ) approach. Two distinct areas at IRP Site 5 were evaluated: an upland habitat area characterized by pavement interspersed with nonnative grassland, and an area consisting of salt marsh and tidal creek habitats. Both soil (in the upland areas) and sediment (in the remaining areas) present complete exposure pathways for ecological receptors at IRP Site 5. The screening level ERA used data collected during the Phase I RI; no new data were collected.

Upland Habitat

In the upland areas of IRP Site 5, ecological risks were determined to be low, and exposure pathways will likely remain muted because of the presence of pavement (TtEMI 2001). HQs calculated using both the high and low TRVs in the food chain models indicate that the deer mouse may be at risk from maximum concentrations of cadmium, lead, manganese, and nickel (Table B-3); however, the upland areas of IRP Site 5 provide only limited habitat and food sources. The maximum concentrations of cadmium and nickel are associated with the former plating-waste pits. Results of the screening-level ERA for IRP Site 5 upland habitat indicate that the site does not pose significant risk to ecological receptors.

Salt Marsh and Tidal Creek Habitats

For the salt marsh and tidal creek habitats, the ERA concluded that the song sparrow was potentially at risk from maximum concentrations of chromium, lead, and high molecular weight (HMW) polynuclear aromatic hydrocarbon (PAH); the light-footed clapper rail was potentially at risk from maximum concentrations of arsenic, chromium, lead, mercury, selenium, HMW PAH, and total DDTs; the surf scoter was potentially at risk from maximum concentrations of lead, manganese, mercury, selenium, HMW PAH, and total DDTs; and the great blue heron was potentially at risk from maximum concentrations of lead, mercury, HMW PAH, and total DDTs (Table B-4).

Chemicals requiring further evaluation for each receptor are listed in Table B-5. Further evaluation was recommended to address the ecological risk posed to birds from these COPCs in marsh sediment at IRP Site 5 (TtEMI 2001).

ERA ADDENDUM

Based on results of the screening-level ERA presented in the Vertebrate Technical Memorandum (TtEMI 2001), a Tier II ERA was conducted to further evaluate the potential ecological risk posed to receptors exposed to sediments in the marsh areas of IRP Site 5. In 2002, sediment and tissue samples were collected from five new sampling locations and analyzed for metals, DDTs, and Aroclors (TtEMI 2005). Also during the 2002 sampling event, both the East and West Reference Areas, established with agency input during the Phase I RI (TtEMI 2000), were sampled and compared with IRP Site 5 data because the site is likely influenced from off-base sources to the north from the Oxnard drainage ditches and to the east from the Calleguas Creek watershed.

The ERA focused on risk to birds in the salt marsh and tidal creek habitats. Risk to plants and invertebrates, evaluated in earlier reports (TtEMI 2000), was evaluated further using the data

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collected during the 2002 sampling event. Mammalian receptors were not considered at risk based on the screening-level ERA and were not evaluated further.

Ingestion of contaminated prey and media is considered to be the predominant exposure pathway at IRP Site 5. For salt marsh and tidal creek habitats, complete exposure routes for plants, aquatic invertebrates, and vertebrates were considered to be direct or coincidental uptake or ingestion of contaminated sediment or tissue and direct exposure to chemicals leaching from sediment into surface water. Assessment endpoints included plants, invertebrates, and representative bird species.

COPCs were identified by screening the maximum concentrations reported in the 2002 sediment samples against toxicity-based benchmarks for plants, invertebrates, and vertebrates. Other chemicals identified as COPCs for birds in the previous screening level ERA (TtEMI 2001) were also evaluated using food chain modeling.

Risk to Plants

Previous investigations had not indicated significant risk to plants at IRP Site 5 (TtEMI 2000). Using data collected during the 2002 sampling event, risk to plants was further evaluated by comparing reported concentrations of COPCs within the salt marsh habitat to toxicity benchmarks and evaluating bioaccumulation potential based on pickleweed tissue residue concentrations.

In the data collected during 2002, maximum concentrations of arsenic, molybdenum, nickel, selenium, silver, and zinc were similar to or slightly greater than the Oak Ridge National Laboratory (ORNL) plant benchmark. Chromium was the only chemical with a maximum concentration that was significantly greater than the ORNL plant benchmark. Metals do not appear to be bioaccumulating at a significant rate; all bioaccumulation factors were less than 1. Some DDTs and Aroclors may be accumulating in plant tissues at higher rates. Except for chromium and silver, concentrations of all the chemicals in the salt marsh habitat at IRP Site 5 were statistically less than concentrations in the reference areas.

Risk to Invertebrates

The screening-level ERA conducted during the Phase I RI (TtEMI 2000) did not identify significant risk to invertebrates at IRP Site 5. Data collected in 2002 to confirm these results identified arsenic, cadmium, chromium, copper, nickel, and silver as invertebrate COPCs because maximum concentrations of these metals exceeded effects-range low values.

All the metal COPCs, with the exception of silver, had maximum concentrations that were less than the effects-range median (ERM) value, the concentration above which adverse effects are considered likely to occur. The maximum concentration of silver slightly exceeded the ERM value in both the salt marsh and tidal creek habitats. Several DDT congeners were also identified as invertebrate COPCs at IRP Site 5. Total DDD, 4,4'-DDE, and total DDTs had maximum concentrations that exceeded the ERM value. Total Aroclors was also identified as an invertebrate COPC, but the maximum concentration was below the ERM value. Site concentrations of all DDT congeners in both habitats were similar to, and in some cases less than, those in the reference areas.

The results of toxicity tests conducted with amphipods and polychaetes for sediment collected from one location in the mudflat area of IRP Site 5 were not significantly different from laboratory controls and do not indicate adverse effects. The simultaneously extracted metals/acid volatile sulfide results indicate that the bioavailability of divalent metals at IRP Site 5, such as arsenic, cadmium, copper, and nickel, was low. In addition, metals are generally less available for uptake under neutral soil conditions like those at the IRP Site 5 salt marsh (TtEMI 2000).

Risk to Vertebrates

The screening-level ERA identified potential risk for the song sparrow, light-footed clapper rail, surf scoter, and great blue heron from COPCs in sediment at IRP Site 5 (TtEMI 2001). Risk to representative birds at IRP Site 5 was evaluated further through a food chain modeling approach using combined data that consisted of new sediment and tissue residue data collected in 2002 and pre-2002 sediment data. HQs calculated for these receptors are presented in Tables B-6 through B-9 (TtEMI 2005).

Chromium presents a significant or immediate risk to the song sparrow (HQ high toxicity reference value [TRV]>1) at doses based on the 95 percent UCL of the arithmetic mean. Cadmium and chromium present a significant or immediate risk to the light-footed clapper rail (HQ high TRV>1) at maximum doses; average doses based on a measure of central tendency, however, do not indicate a significant or immediate risk (HQ high TRV<1) to the light-footed clapper rail.

Song sparrows and light-footed clapper rails have relatively small foraging ranges, and individual birds located in areas with elevated cadmium or chromium concentrations may be at risk. The greatest cadmium and chromium concentrations were reported from the pre-2002 data and are located near the former plating-waste pits. Chromium concentrations are greater at IRP Site 5 than those in either the East or West Reference Areas. The maximum concentrations of cadmium from the salt marsh and salt marsh/tidal creek habitats at IRP Site 5 are greater than those at the reference areas, with the exception of the West Reference Area, for the tidal creek habitat.

Conclusions

The ERA Addendum concluded that COPCs in sediment at IRP Site 5 do not pose significant risk to populations of plants and that adverse effects to populations of invertebrates are unlikely (TtEMI 2005). Chromium concentrations at IRP Site 5 were statistically greater than concentrations at the reference areas and potentially pose significant or immediate risk to the song sparrow and light-footed clapper rail, a special-status species. Cadmium concentrations at IRP Site 5 were statistically greater than concentrations at the West Reference Area and may also pose significant or immediate risk to the light-footed clapper rail.

Based on the results of the ERA Addendum and given the potential of exposing on-site receptors to elevated cadmium and chromium concentrations, a response that either eliminates or minimizes the exposure is required for sediment at IRP Site 5. However, subsequent to the issuance of the Draft EE/CA Report (Insight and Earth Tech, Inc. 2007), regulators requested that copper, lead, nickel, and silver be addressed in addition to cadmium and chromium and that removal goals and alternatives presented in the EE/CA be protective of small mammals in

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addition to birds. Therefore, given the potential of exposing on-site receptors to elevated COC concentrations, a response that either eliminates or minimizes the exposure is required for sediment at IRP Site 5.

The Navy will consult with California Department of Fish and Game regarding the removal action such that it minimizes disturbance to special status wild life. Considerations will include seasonal timing and other measures during the removal action activities, such as proximity of the wild life, time-of-day for operating equipment and other constraints.

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4 ENDANGERMENT DETERMINATION

Ecological risk assessment results summarized in Section 3.2, and pertinent information contained in the Administrative Record confirm that current conditions at IRP Site 5 present a threat to ecological receptors and warrant implementation of an NTCRA.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to ecological receptors and the environment.

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5 SELECTED ACTION AND ESTIMATED COSTS

5.1 SELECTED ACTION

This section describes the selected removal alternative for this NTCRA, as well as other alternative technologies that were evaluated but not selected. A discussion of applicable or relevant and appropriate requirements (ARARs) and the proposed project schedule are also included.

5.1.1 Selected Action Description

The DON proposes to excavate approximately 2,700 bank cubic yards (bcy) of COC-impacted sediment at IRP Site 5 (Figure A-5) to an average depth of approximately 6 feet below ground surface followed by dewatering and chemical profiling of the excavated sediment, loading and transporting the impacted sediment to the landfill(s), and backfilling the excavation.

The excavated sediment will be temporarily stored in staging piles for dewatering. Chemical profiling will be conducted for the dewatered sediment and the water generated as a result of sediment dewatering. Dewatered sediment will be loaded into trucks to be transported and disposed of at an approved disposal facility. The water generated as a result of sediment dewatering, if necessary, will be sent to an approved disposal facility. It has been assumed that 15 percent of the excavated sediment will be classified as Resource Conservation and Recovery Act (RCRA)-hazardous waste and 85 percent of the excavated sediment will be classified as non-hazardous waste and will require treatment and disposal at an approved disposal facility. Following excavation, confirmation sampling will be conducted for cadmium, chromium, copper, nickel, lead, and silver to ensure that target cleanup goals based on removal action objectives are attained and are protective of birds and small mammals. Excavated areas will then be backfilled with clean sediment and compacted. The Navy in cooperation with the California Department of Fish and Game will reconstitute the excavated areas to pre-existing wetland habitat. The backfill will be designed and constructed with clean sediment similar to the physical composition of the surrounding sediment bed, with the intent that the wetland ecological community would recolonize the excavated area.

Removal of the contaminated sediment would effectively minimize potential risks or other impacts to the environment.

5.1.2 Contribution to Remedial Performance

It is anticipated that the significant COC-impacted sediment contamination will be excavated, removed, treated, and/or disposed. However, this removal action is an interim step, designed to remove/reduce imminent risks, until the acceptable levels have been defined and the results of this removal action can be compared to those levels. If sediment concentrations in portions or all of the removal action area do not meet the acceptable levels, additional response actions may be required.

5.1.3 Description of Alternative Technologies

The removal action objective for the IRP Site 5 wetland sediment is as follows:

- Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium, 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment.

Also, because the wetland sediment at IRP Site 5 is adjacent to Mugu Lagoon and is connected to Mugu Lagoon by a tidal creek, the selected alternative would ensure that the wetland sediment at IRP Site 5 is not a source of non protective levels of chromium to Mugu Lagoon. Mugu Lagoon is designated as IRP Site 11 and has a remediation goal of 81 mg/kg for chromium.

The following three alternatives were considered during the preparation of the EE/CA (Appendix D):

- Alternative 1 – No Action
- Alternative 2 – Institutional Controls
- Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal

Each alternative was evaluated in terms of effectiveness, implementability, and cost. The three removal action alternatives are described below.

Alternative 1 – No Action

This alternative provides a baseline condition if no removal action is taken. Under this alternative, none of the general response actions including excavation, and off-site treatment would be implemented for contaminated sediment at IRP Site 5 and current status of the site remains unchanged relative to contaminant concentrations.

This alternative would not be protective of the environment as it does not reduce the risk from exposure to the contaminated sediment at the site and would not attain removal action goals. The effectiveness is low because future removal actions may be required to address the contamination remaining at the site. This alternative has no effect on the toxicity, mobility, and volume of contaminants other than that obtained through the natural attenuation processes.

Alternative 2 – Institutional Controls

Under Alternative 2, institutional controls (ICs) would be designed and put in place to restrict site use and the uncontrolled disturbance and release of the COC-impacted sediment of AOEC 1. The COC-impacted sediment of AOEC 1 would remain in place. No removal measures would be implemented to reduce concentrations of COCs in the sediment, alter transport/exposure pathways, or reduce/limit risks to receptors (birds; i.e., song sparrow and light-footed clapper rail; and small mammals; i.e., deer mouse).

ICs would be designed and put in place, and would include the following elements.

Section 5 Selected Action and Estimated Costs

- Prohibitions on the alteration, disturbance, or removal of surface or subsurface AOEC 1 sediment, including but not limited to construction, without prior review and written approval from the Navy and the regulatory agencies.
- Provisions for access for future monitoring and inspection activities by the Navy and regulatory agencies.
- Requirements and procedures to notify the Navy and the regulatory agencies of any changes in conditions of AOEC 1 that could potentially compromise the remedy or endanger its ecology and its habitats.

The effectiveness of the ICs would be reviewed periodically as part of the CERCLA 5-year review process.

The estimated net present-worth of Alternative 2 using the Remedial Action Cost Engineering Requirements (RACER™) 2007 system Version 9.1.0 presented in the EE/CA is \$937,000. The present-worth analysis assumed an operation and maintenance period of 30 years and a discount rate of 2.8 percent.

In summary, this alternative does not remove the contamination from the site, and there is potential for migration of the impacted sediment and continuing birds and small mammals exposure. This alternative would result in continued exposure of these receptors, will not be protective, and does not meet the removal action objectives.

Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal

Alternative 3 would involve excavation of COC-impacted sediment at IRP Site 5 (Figure A-5), dewatering and chemical profiling of the excavated sediment, loading and transporting the impacted sediment to the landfill(s), backfilling the excavation, and reconstitution of the salt marsh.

The excavated sediment would be temporarily stored in staging piles as for dewatering. Chemical profiling will be conducted for the dewatered sediment and the water generated as a result of sediment dewatering. Dewatered sediment will be loaded into trucks to be transported and disposed of at an approved disposal facility. The water generated as a result of sediment dewatering, if necessary, will be sent to an approved disposal facility. Following excavation, confirmation sampling would be conducted for cadmium, chromium, copper, nickel, lead, and silver to ensure that target cleanup goals based on removal action objectives are attained and are protective of birds and small mammals. Excavated areas would then be backfilled with clean sediment and compacted. The Navy in cooperation with the California Department of Fish and Game will reconstitute the excavated areas to pre-existing wetland habitat. The backfill will be designed and constructed with clean sediment similar to the physical composition of the surrounding sediment bed, with the intent that the wetland ecological community would recolonize the excavated area.

As part of the NBVC Point Mugu Integrated Natural Resource Management Plan (INRMP), the Navy has an ongoing program that includes annual monitoring of salt marsh bird's-beak habitat

at NBVC Point Mugu. According to the 2007 survey, the closest mapped habitat is south of Beach Road and approximately 950 feet west of the IRP Site 5 boundary. The most recent survey will be consulted prior to removal action. Excerpts from the 2007 survey are provided as Attachment B of the Final Feasibility Study (BEI 2008).

As a cooperative plan, the INRMP entails coordination with two regulatory agencies, the United States Fish and Wildlife Service and the California Department of Fish and Game. In accordance with the INRMP, Navy owned lands are managed to ensure that projects carried out by the Navy do not jeopardize the continued existence of salt marsh bird's-beak, and to help foster the recovery of salt marsh bird's-beak.

This alternative would attain the removal action objectives for the IRP Site 5. Removal of the contaminated sediment would effectively minimize potential risks or other impacts to the environment. The action represents a permanent solution to the problem of contaminated sediment at the site. The estimated volume of COC-impacted sediment to be excavated is 2,700 bcy. In addition, it is assumed that 15 percent of the excavated sediment will be classified as RCRA-hazardous waste and 85 percent of the excavated sediment will be classified as non-hazardous waste and will require treatment and disposal at an approved disposal facility.

The estimated net present worth of Alternative 3 is \$1,342,000. The costs for implementation of Alternative 3 (estimated using RACER™ 2007 system Version 9.1.0) and associated assumptions are summarized in Tables B-10 and B-11, respectively. The detailed cost estimates are presented in the EE/CA (Appendix D). The principal cost items are excavation of contaminated sediment, dewatering of the contaminated sediment, transportation, and disposal at an approved off-site disposal facility.

In summary, this alternative would reduce toxicity, mobility, and volume of COC-impacted sediment on site, thereby providing long-term effectiveness and protection to the environment. This alternative meets the removal action objectives and is easily implementable. This alternative provides the best balance between costs and overall effectiveness based upon above mentioned factors.

5.1.4 Engineering Evaluation/Cost Analysis

An EE/CA has been developed for this NTCRA (Insight and Earth Tech, Inc. 2009). The EE/CA identified and compared three cleanup alternatives for the COC-impacted sediment at IRP Site 5. The criteria used in this comparison are effectiveness, implementability, and cost. The EE/CA is provided in Appendix D. The Final EE/CA and supporting documents were made available for public review and comment.

5.1.5 Applicable or Relevant and Appropriate Requirements

Section 300.415(j) of the NCP provides that removal actions must attain ARARs to the extent practicable, considering the exigencies of the situation.

Section 300.5 of the NCP defines applicable requirements as cleanup standards, standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under Federal environmental or State environmental or facility siting laws that

Section 5 Selected Action and Estimated Costs

specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstances at a CERCLA site.

Section 300.5 of the NCP defines relevant and appropriate requirements as cleanup standards, standards of control and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, or contaminant, remedial action, location, or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site and are well-suited to the particular site.

Because CERCLA on-site response actions do not require permitting, only substantive requirements are considered as possible ARARs. Administrative requirements such as approval of, or consultation with administrative bodies, issuance of permits, documentation, reporting, record keeping, and enforcement are not ARARs for CERCLA actions confined to the site.

Only those State standards that are identified by a State in a timely manner and are more stringent than Federal requirements may be applicable or relevant and appropriate.

There are three types of ARARs. The first type includes "contaminant-specific" requirements. These ARARs set limits on concentrations of specific hazardous substances, contaminants, and pollutants in the environment. Examples of this type of ARAR are ambient water quality criteria and drinking water standards. The second type of ARAR includes location-specific requirements that set restrictions on certain types of activities based on site characteristics. These include restrictions on activities in wetlands, floodplains, and historic sites. The third type of ARAR includes action-specific requirements. These are technology-based restrictions, which are triggered by the type of action under consideration. Examples of action-specific ARARs are RCRA regulations for waste treatment, storage, and disposal.

ARARs must be identified on a site-specific basis from information about specific chemicals at the site, specific features of the site location, and actions that are being considered as removal actions. The discussion that follows is an ARARs analysis for the most salient ARARs for the selected alternative. It may include ARARs that potentially apply, but are eliminated when actual fieldwork provides more specific information.

5.1.5.1 *FEDERAL ARARs*

The purpose of identifying and evaluating federal ARARs by the DON is described in this subsection. The federal government implements a number of environmental statutes that are a source of potential federal ARARs either in the form of the statutes themselves or regulations promulgated thereunder. The ARAR analysis conclusions for the selected action are presented below and a complete evaluation of potential ARARs is provided in the EE/CA (Appendix D).

The selected removal action was reviewed against all potential ARARs, including but not limited to those set forth at 55 Federal Register (Fed. Reg.) 8764-8765 (1990), in order to determine whether they are applicable or relevant and appropriate utilizing CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

The preamble to the NCP indicates that State regulations that are components of a Federally authorized or delegated State program are generally considered federal requirements and potential federal ARARs for the purposes of ARARs analysis (55 Fed. Reg. 8666, 8742 [1990]). The State of California received approval for its base RCRA hazardous waste management program on 23 July 1992 (57 Fed. Reg. 32726 [1992]). The State of California "Environmental Health Standards for the Management of Hazardous Waste," set forth in Title 22 California Code of Regulations, Division 4.5 (Cal. Code Regs. tit. 22, div. 4.5), were approved by the U.S. EPA as a component of the Federally authorized State of California RCRA program. On 26 September 2001, California received final authorization of its revised State Hazardous Waste Management Program by the U.S. EPA (63 Fed. Reg. 49118 [2001]). The regulations of Cal. Code Regs. tit. 22, div. 4.5 are, therefore, a source of potential Federal ARARs for CERCLA response actions. The Federal requirements at 40 CFR pt. 261 do not apply in California because the State RCRA program is authorized.

Federal Chemical-Specific ARARs. The excavated sediment and water generated as a result of sediment dewatering generated during the construction phase of the removal action may potentially be a hazardous waste. Therefore, federal regulations for waste characterization including Cal. Code Regs. tit. 22 Sections 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are applicable requirements for determining whether the excavated sediment and water generated as a result of sediment dewatering is a RCRA hazardous waste.

The dewatering of sediments under the selected alternative would generate wastewater that is proposed to be discharged to tidal creek. The relatively high concentrations of COCs in IRP Site 5 sediment indicate that wastewater generated during sediment dewatering could exhibit toxicity characteristic of RCRA hazardous waste. Therefore, an analysis of concentrations of COCs in wastewater would be required to determine if it exhibits toxicity characteristic of RCRA hazardous waste. Therefore, federal regulations at 40 C.F.R. part. 261.24(a) Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B) are applicable for determining whether waste is hazardous.

The substantive provisions of National ambient water quality standards at 40 C.F.R. §§ 131.36(b) and 131.38 and the Clean Water Act (CWA) 301(b) were determined to be ARARs for discharges associated with sediment dewatering to tidal creek proposed under the selected alternative.

The substantive provisions of 33 U.S.C., ch. 26, § 1314(a) and 42 U.S.C., ch. 103, § 9621(d)(2) 64 Fed. Reg. 19,781 (22 April 1999) are relevant and appropriate for discharge of water generated as a result of sediment dewatering to the tidal creek.

Federal Location-Specific ARARs. Wetlands protection, biological resources, and coastal resources are the resource categories relating to location-specific requirements potentially affected by the IRP Site 5 response actions.

The substantive requirements at 40 C.F.R. § 6.302 (a) and CWA Section 404 (33 U.S.C. § 1344) are relevant and appropriate for protection of wetlands. Measures would be taken to prevent or mitigate potential impacts to wetlands.

Section 5 Selected Action and Estimated Costs

Since IRP Site 5 may have protected species and migratory birds, the removal action for IRP Site 5 would need to comply with the substantive provisions of the Endangered Species Act and Migratory Bird Treaty Act. The Migratory Bird Treaty Act (16 U.S.C. § 703) is a relevant and appropriate federal location-specific ARAR. The birds have not been identified as specifically using IRP Site 5, but several species have been documented as visiting Mugu Lagoon, and may visit IRP Site 5. The Endangered Species Act including regulation 16 U.S.C. § 1536(a), (h)(1)(B) is an applicable federal-location specific ARAR. The salt marsh bird's beak (endangered plant) and the light-footed clapper rail (endangered bird) have been observed at IRP Site 5. Removal activities would be conducted in a manner protective of wildlife species, including migratory birds and endangered or threatened species. Surveillance and scheduling of removal activities that could disturb seasonal use or breeding would be used to minimize potential adverse effects.

In addition, the substantive provisions of the Coastal Zone Management Act (16 U.S.C. § 1456(c) 15 C.F.R. § 930) are potentially relevant and appropriate since IRP Site 5 is located on a sand bar between Mugu Lagoon and the Pacific Ocean.

Federal Action-Specific ARARs. Actions evaluated as a part of the contaminated sediment removal action alternative for IRP Site 5 include waste identification, on-site temporary storage; and on-site placement of treated sediment. The excavated sediment and water generated as a result of sediment dewatering would be subject to RCRA requirements at Cal. Code Regs. tit. 22, § 66262.10(a) and § 66262.11 to determine whether such wastes should be classified as hazardous. The requirements of 40 C.F.R. § 264.554(d)(1)(i-ii), (d)(2), (e), (f), (h), (i), (j), and (k) are applicable for temporary storage of the excavated sediment in a staging pile.

The time period of this temporary storage is not expected to exceed 2-years; therefore, a staging pile as defined in 40 C.F.R. § 264.554 (a) would be used for on-site temporary storage of sediment. The design, operating and closure criteria defined at 40 C.F.R. § 264.554(d)(1)(i-ii), (d)(2), (e), (f), (h), (i), (j), and (k), constitute applicable ARARs for the staging pile used for temporary storage of the sediment that exhibits the characteristics of RCRA hazardous waste. In the event that containers are used for on-site storage of sediment and sediment exhibits the characteristics of RCRA hazardous waste, the substantive RCRA container storage requirements at Cal. Code Regs. tit. 22, §§ 66264.171, 66264.172, 66264.173, 66264.174, and 66264.175(a) and (b) would be applicable.

The substantive provisions of CWA Section 402 (33 U.S.C. ch. 26, § 1342) and 40 C.F.R. § 122.44(k)(2) and (4) are applicable federal ARARs for incidental discharge of impacted sediment to surface water through erosion and runoff, discharge of water from the dewatering process to the tidal creek, and for storm water discharges during construction activities. In addition, the substantive provisions of 40 C.F.R. § 230.10(a), (c), and (d); 230.60(c) and (d); and 230.61 are applicable for the excavation of the contaminated sediment in the wetlands at IRP Site 5.

The requirements of the Ventura County Air Pollution Control District (VCAPCD) that have been approved into the State Implementation Plan and are therefore considered to be federal ARARs include substantive provisions of the Rule 50.

5.1.5.2 STATE ARARs

The ARARs submitted by State agencies were evaluated and compared to their Federal counterparts to assess which ARARs are the most stringent or are in addition to the Federal ARARs.

State Chemical-Specific ARARs. State of California regulations related to the identification of non-RCRA hazardous waste are applicable for the excavated sediment and water generated as a result of sediment dewatering during the removal action. These regulations include Cal. Code Regs. tit. 22 § 66261.22(a)(3) and (4), § 66261.24(a)(2) to (a)(8), § 66261.101, § 66261.3(a)(2)(C) and § 66261.3(a)(2) (F).

State Location-Specific ARARs. The substantive requirements of Cal. Fish and Game Code §§ 2080, 3005, 3503.5, 3511, 3800, 4150, and 5600 (a), (b), & (f) are potential state ARARs for IRP Site 5 removal action if the animal and bird species specified in the regulations are identified at the site. Measures will be taken to avoid the take of birds or animals identified in the regulations during the implementation of removal action at IRP Site 5. In addition, the California Coastal Act of 1976 is a relevant and appropriate state location-specific ARAR since IRP Site 5 is located in a coastal area.

State Action-Specific ARARs. The substantive provisions of VCAPCD Rule 62.1 are applicable for the proposed removal action. However, toxic emissions to the air are not expected, and the dust control proposed should adequately control the potential for any toxics if present.

5.1.6 Project Schedule

The project schedule, subject to funding, is expected to require approximately 1 week for excavation, two weeks for laboratory analysis, and three weeks for backfilling and site restoration. A preliminary report of findings would be available to agencies within 2 months after fieldwork completion. The fieldwork, including confirmation sampling, is scheduled to be conducted in 2011 (see Figure A-6).

5.2 ESTIMATED COSTS

The DON has made a present worth estimate of the removal action costs. The estimated costs include the direct and indirect capital costs. The estimated costs and the assumptions and parameters used for the cost estimate are presented in Tables B-10 and B-11, respectively.

6 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If action should be delayed or not taken, exposure of receptors (birds; i.e., song sparrow and light-footed clapper rail; and small mammals; i.e., deer mouse) to COCs could potentially occur from exposure to the sediment and prey at IRP Site 5. Contamination could spread from the sites to nearby areas via bioturbation by burrowing organisms and surface water runoff. This spread of contamination would result in an increased risk to the exposed population. Delayed action will also increase ecological risks to the receptors through prolonged exposure to contaminants via ingestion of contaminated sediment and prey that has accumulated the impacted sediment.

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7 PUBLIC INVOLVEMENT

The DON circulated the Draft Final Action Memorandum, which included Final EE/CA as an Appendix in accordance with the Community Relations Plan prepared by NBVC Point Mugu to facilitate public involvement in the decision-making process, and the Administrative Record was made available to the public. Public notice of the proposed removal action, and notification of public comment period on this proposal, was provided in the Ventura County Star from August 6, 2010 till August 8, 2010. As required in 40 CFR Section 300.415(n), on 6 August 2010, DON made the Draft Final Draft Final Action Memorandum, which included Final EE/CA as an Appendix and the AR available for public comment till 4 September 2010. Pertinent documents from the AR were made available for public for review at NBVC Port Hueneme information repository. The AR also included investigation reports, sampling and analysis information, the EE/CA, and other documents that the DON has referenced to select the removal action.

There were no public comments received on the Draft Final Action Memorandum which included Final EE/CA as an Appendix.

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8 OUTSTANDING POLICY ISSUES

There are no outstanding policy issues at this time.

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9 RECOMMENDATION

The Action Memorandum was prepared in accordance with current U.S. EPA and U.S. Navy guidance documents for NTCRA's under CERCLA. This Action Memorandum documents, for the Administrative Record, the DON's decision to undertake a NTCRA at IRP Site 5 at NBVC Point Mugu, California.


In arriving at this decision, three alternatives were identified, evaluated, and ranked. The alternatives included:

- Alternative 1 – No Action
- Alternative 2 – Institutional Controls
- Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal

Based on the comparative analysis of the removal action alternatives completed in the EE/CA and summarized in Section 5.1.4, the recommended removal action is Alternative 3. This alternative entails excavation of COC-impacted sediment at concentrations exceeding the SMOs, and disposal at an appropriate off-station disposal facility. The Navy in cooperation with the California Department of Fish and Game will reconstitute the excavated areas to pre-existing wetland habitat. The backfill will be designed and constructed with clean sediment similar to the physical composition of the surrounding sediment bed, with the intent that the wetland ecological community would recolonize the excavated area.

This alternative is recommended because it is highly effective in protecting the environment by removing contaminated sediment from IRP Site 5. Moderate technical and administrative efforts are required for implementation of this alternative. The selected removal action alternative is cost effective since it will result in a permanent reduction in risk to the environment.

This decision document represents the selected removal action for IRP Site 5, NBVC Point Mugu, California developed in accordance with CERCLA as amended and is not inconsistent with the NCP. This decision is based on the administrative record for the site.



Captain James McHugh (Date)
Commanding Officer
Naval Base Ventura County, CA

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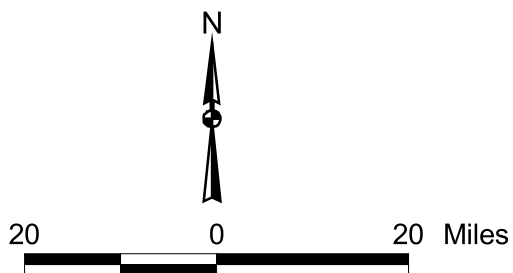
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APPENDIX A

FIGURES



IRP Site 5 Action Memorandum

Figure A-1

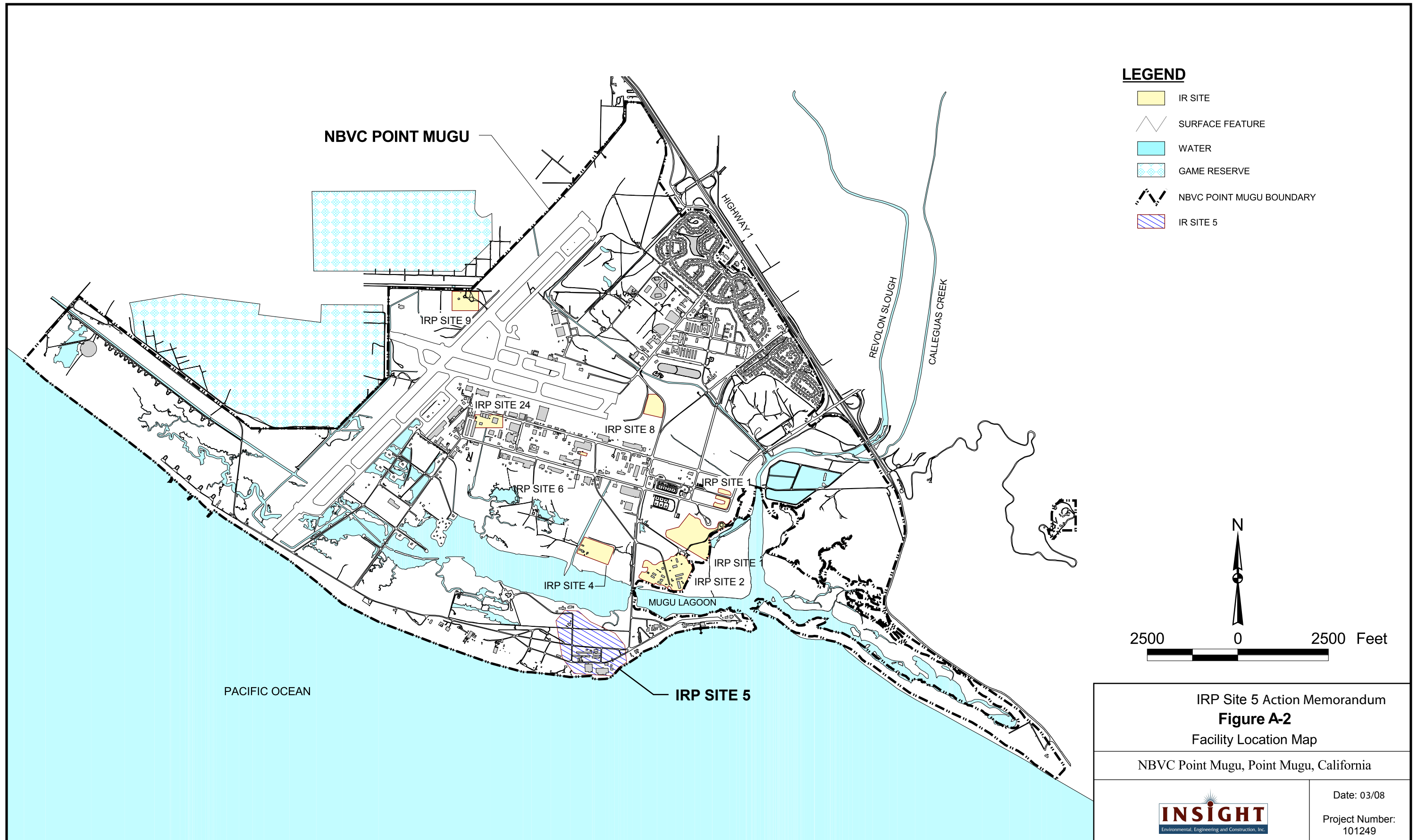
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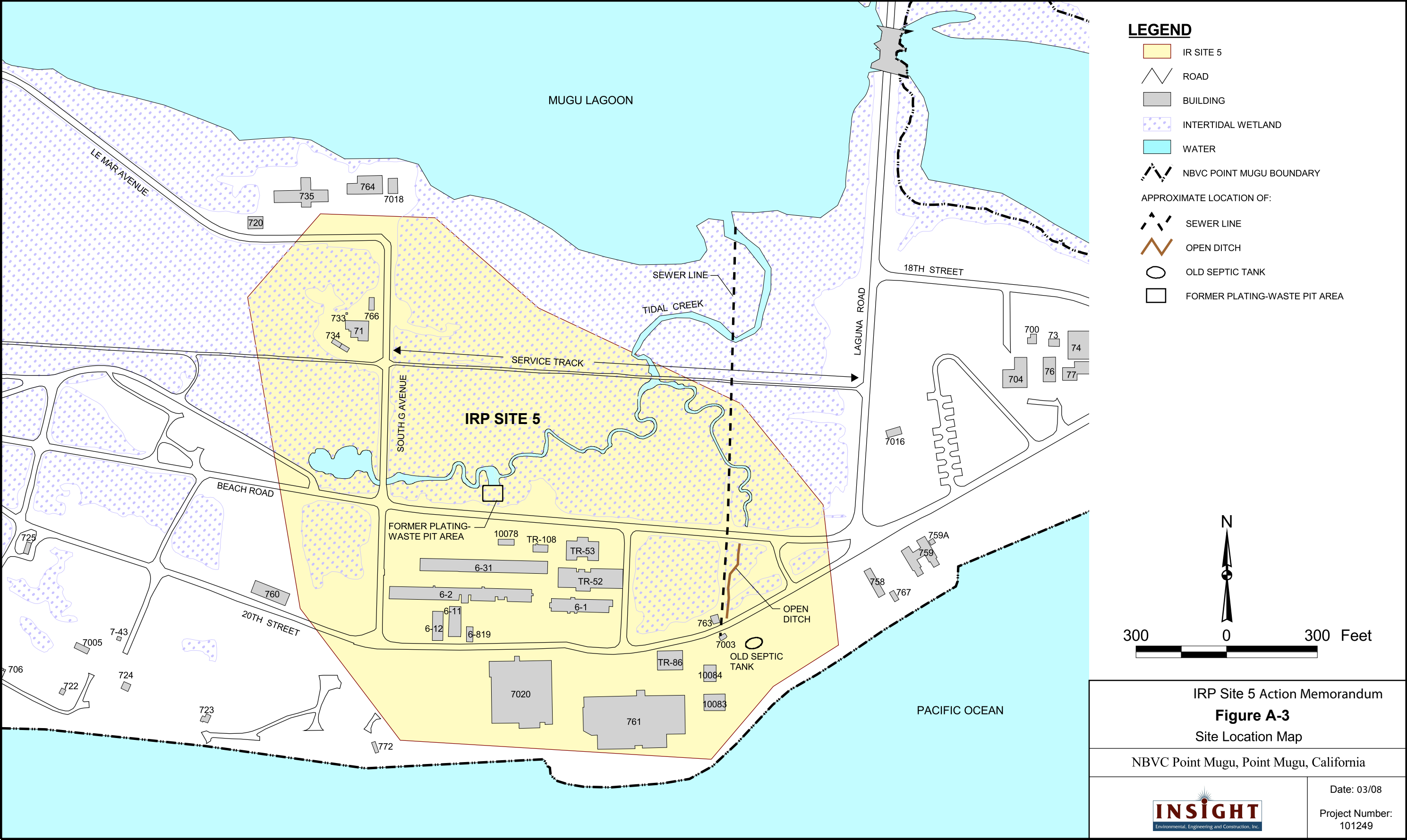
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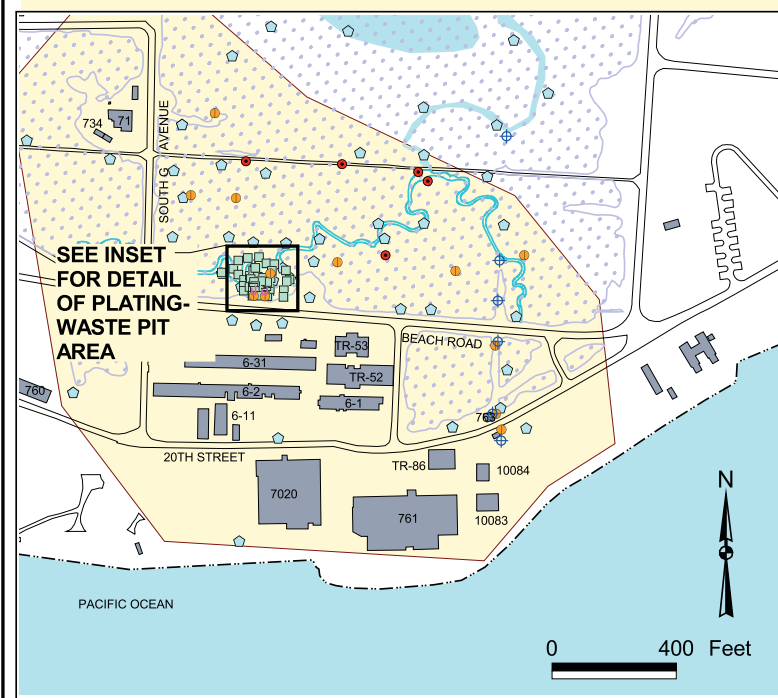
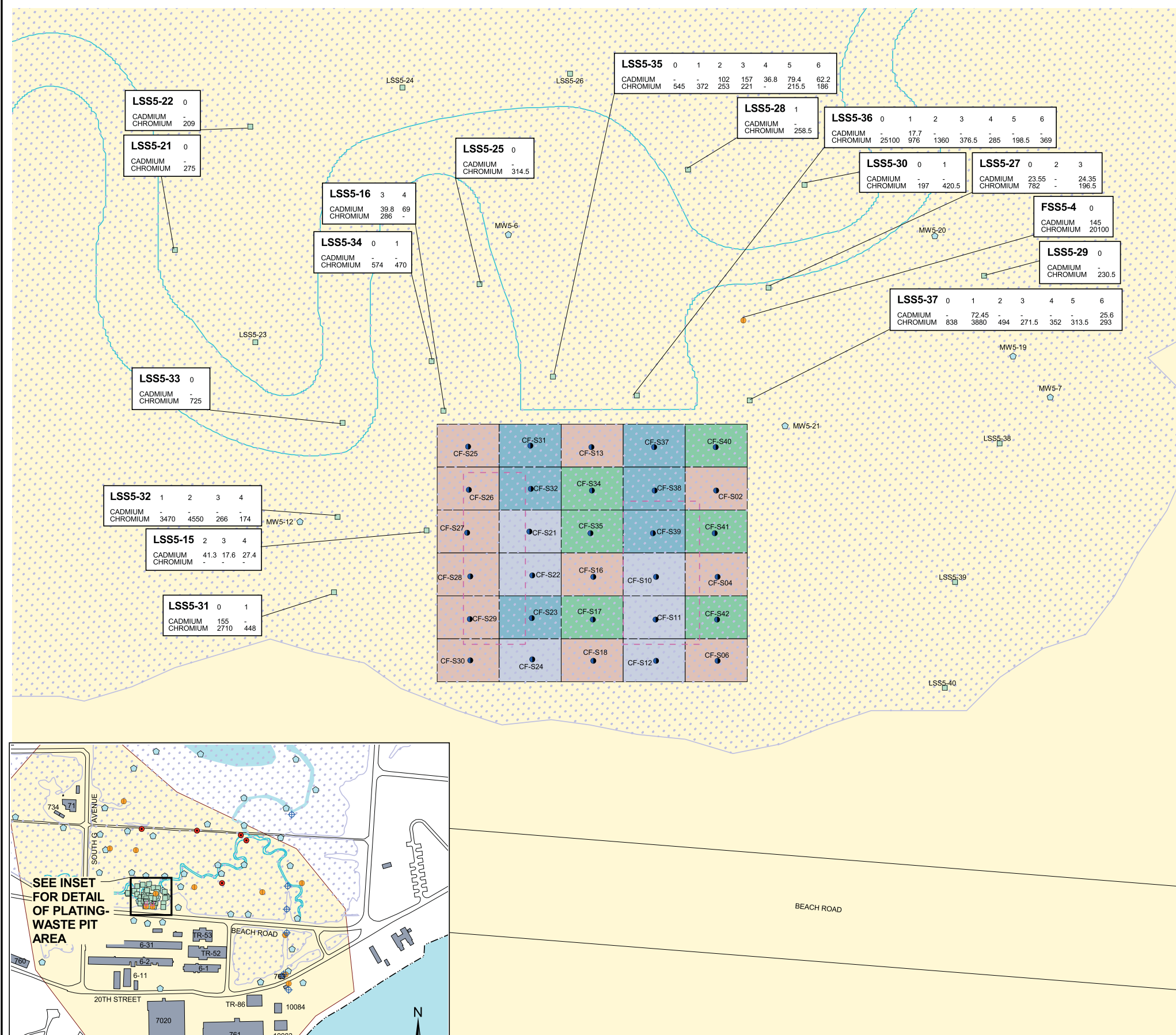


Date: 03/08

Project Number:
101249

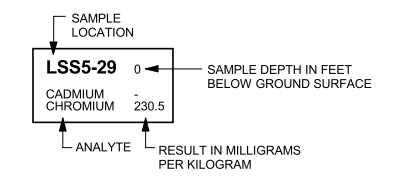




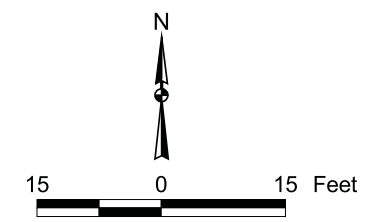


LEGEND

- PLATING-WASTE PITS
- EK DEMOLITION EXCAVATION DEPTH 6 FEET (ELEVATION 5 FEET ABOVE MEAN SEA LEVEL)
- EK DEMOLITION EXCAVATION DEPTH 9 FEET (ELEVATION 8 FEET ABOVE MEAN SEA LEVEL)
- EK DEMOLITION EXCAVATION DEPTH 12 FEET (ELEVATION 11 FEET ABOVE MEAN SEA LEVEL)
- EK DEMOLITION EXCAVATION DEPTH 14 FEET (ELEVATION 13 FEET ABOVE MEAN SEA LEVEL)
- SITE INSPECTION (FUGRO-McCLELLAND 1991)
NOTE: AN "F" WAS ADDED TO SAMPLE DESIGNATIONS TO AVOID CONFUSION WITH OTHER SAMPLES HAVING SIMILAR DESIGNATIONS
- EMERGENCY REMOVAL ACTION (PRC 1995)
- INITIAL DATA CHARACTERIZATION EVENT (LB&M ASSOCIATES 1997)
NOTE: AN "L" WAS ADDED TO SAMPLE DESIGNATIONS TO AVOID CONFUSION WITH OTHER SAMPLES HAVING SIMILAR DESIGNATIONS
- PHASE 1 REMEDIAL INVESTIGATION TECH MEMO (TIEMI 2000)
- PHASE 2 REMEDIAL INVESTIGATION REPORT (BATTELLE 2002)
- ECOLOGICAL RISK ASSESSMENT ADDENDUM (TIEMI 2005)
- DEMOLITION ACTIVITIES REPORT (TN&A 2004)
- INTERTIDAL WETLANDS
- CREEK
- ROAD
- BASE BOUNDARY
- BUILDING
- WATER
- IRP SITE 5



NOTES:
SEDIMENT MANAGEMENT OBJECTIVE FOR CADMIUM IS 17.5 mg/kg
SEDIMENT MANAGEMENT OBJECTIVE FOR CHROMIUM IS 172 mg/kg
-- RESULTS BELOW SEDIMENT MANAGEMENT OBJECTIVE



IRP Site 5 Action Memorandum
Figure A-4
Results Exceeding the Sediment Management Objectives, Current Conditions

NBVC Point Mugu, Point Mugu, California

INSIGHT
Environmental, Engineering and Construction, Inc.

Date: 03/08
Project Number:
101249

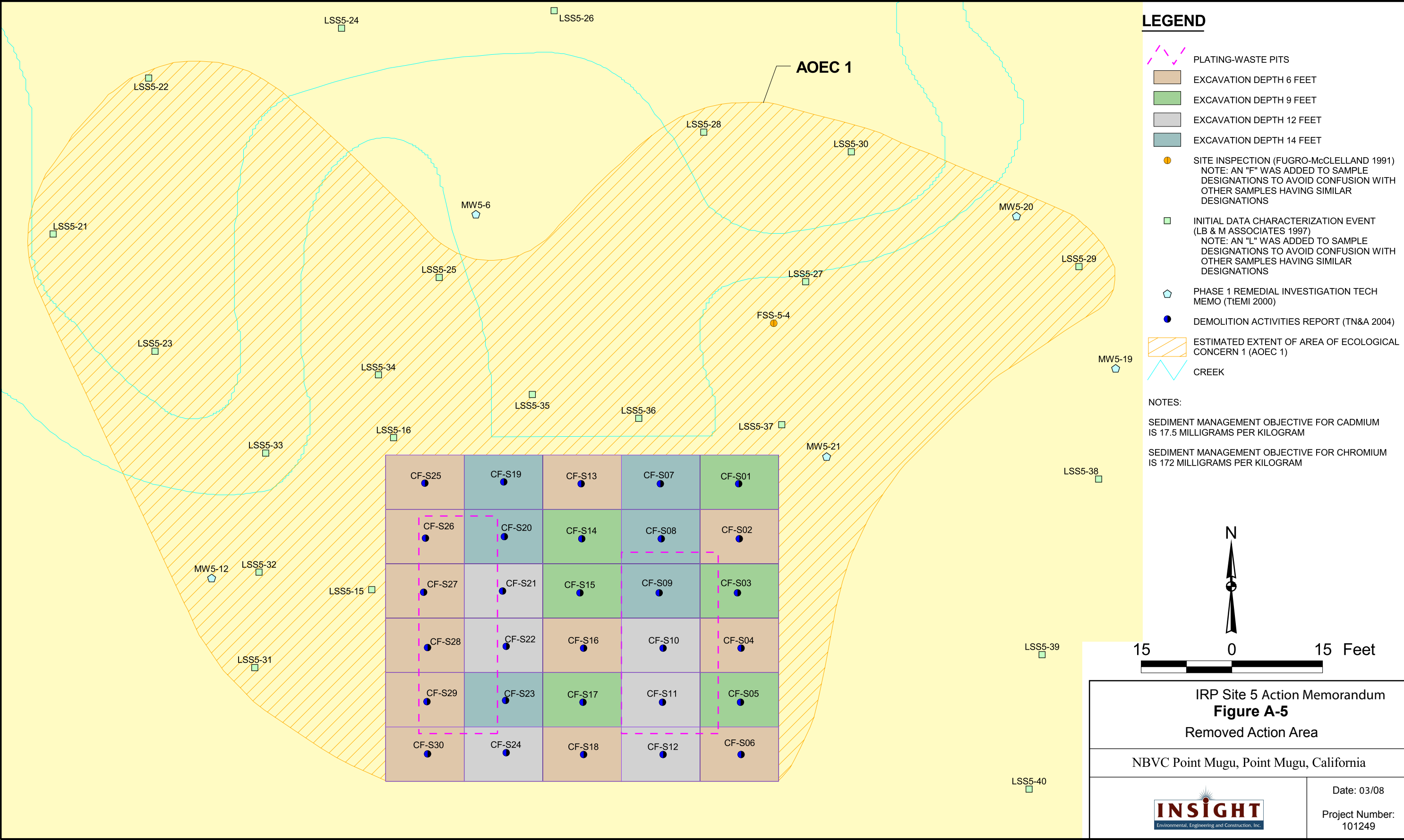
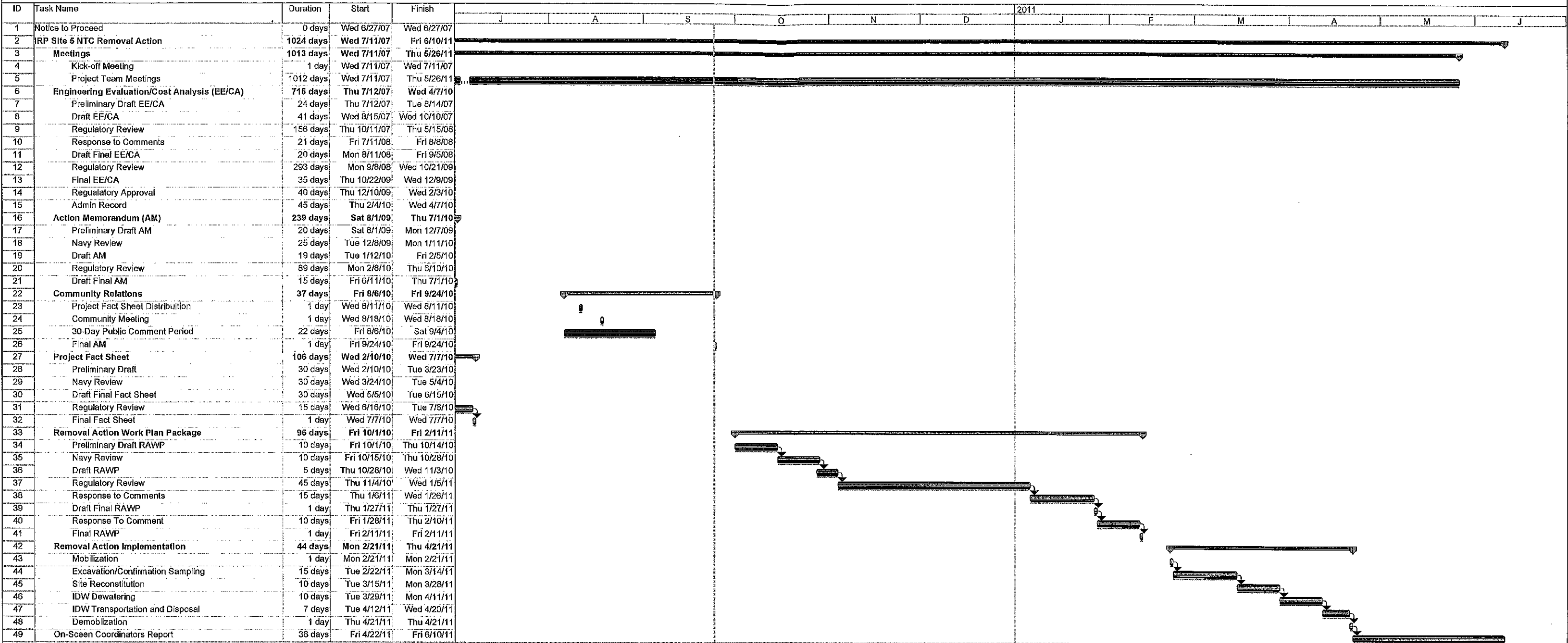


Figure A-6: Project Schedule
Non-Time Critical Removal Action
IRP Site 5, Wetland Sediment
Naval Base Ventura County, Point Mugu, California.



APPENDIX B

TABLES

Table B-1
Waste Generation and Handling Summary

| Building | Origin of Waste | Waste Type | Estimated Amount | Discharge/Disposal Location ^a | Operational Period |
|---------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 6-20*, 71 | Chemical laboratories | Organic solvents, rocket fuels, and miscellaneous laboratory chemicals | 10–50 gallons | Septic tank | 1947–1950 |
| | | | 50–500 gallons | Slough east of Building 71 on the east side of South G Avenue and north of the service track | 1949–1970 |
| 6-59* | Plating shop | Plating rinsate (reportedly contained high concentrations of cyanide and various metals, including chromium, copper, zinc, and tin) | 21,000,000 to 95,000,000 gallons | Slough just north of Beach Road, across from Building 6-31 (slough discharged into Mugu Lagoon) or plating-waste pits | 1948–1965 |
| | | Chromic acid, chrome etch, and carbon remover | 1,000 gallons | | |
| | Plating shop/surface treatment | Carbon tetrachloride and trichloroethylene | 1,000–10,000 gallons | | |
| 6-85* | Sandblasting shop | Sand and paint chips | 500–2,000 cubic feet | IRP Site 5 (exact location has not been identified) | 1948–1967 |
| 6-31, 6-32*, 6-33*, 6-58* | Machine, heat treatment, and engineering shops | Carbon tetrachloride, waste oil, and cutting oil | 1,000–5,000 gallons | Slough or plating-waste pits | 1950–1965 |
| 6-15* | Photo shop | Photograph fixer and developer containing silver, potassium bromide, and phenols | 30,000–60,000 gallons | Drain that led to septic tank in southeastern portion of IRP Site 5 south of 20th Street (septic tank discharged into open ditch in triangular area east of South F Avenue; ditch ultimately discharged into Mugu Lagoon) | 1947–1954 |
| 311 (IRP Site 6) | Sandblasting at technical support shop | Glass beads and paint chips | 10–500 cubic feet | IRP Site 5 (exact location has not been identified) | 1965–1978 |

Notes:

*building no longer exists

Acronyms/Abbreviations:

IRP Installation Restoration Program

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Table B-2
Summary of Previous Investigations

| Dates | Description | Reference |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1984 | Approximately 200 gallons of diesel fuel spilled onto the ground during removal of a buried tank from the parking area east of Building 6-1. Approximately 120 gallons of the spilled fuel was recovered and the contaminated soil was removed and treated. | SCS and Landau Associates 1985 |
| 1985 | The IAS identified IRP Site 5 for further investigation. Information in the IAS consisted of Old Area 6 Shops historical information summaries and lists of types and quantities of wastes disposed at the site. Environmental samples were not collected as a part of the IAS. | SCS and Landau Associates 1985 |
| 1989–1991 | The SI reported metals, VOCs, SVOCs, and DDTs, in IRP Site 5 soil. The contaminants were expected to have an impact on the Mugu Lagoon environment and possibly on human health. The SI Report therefore recommended further study. | Fugro-McClelland 1991 |
| 1993–1994 | The Phase I RI reported SVOCs and metals in soil samples; pesticides, PCBs, and metals in sediment samples; metals in surface water samples; and metals in groundwater samples. An ERA was performed, which included a biological characterization and a scoping assessment. The ERA identified antimony, chromium, copper, lead, nickel, silver, zinc, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, gamma-chlordane, and Aroclor 1260 as ecological COPCs for IRP Site 5. The ERA concluded that upland areas of IRP Site 5 do not provide extensive wildlife habitat, and ecological exposure to soil contaminants in the upland area is minimal. Although elevated levels of heavy metals were detected at the former plating-waste pits and were identified as COPCs, at the time of the Phase I RI, exposure was mitigated by coverings placed on the pits. Based on the results of toxicity tests and benthic community analyses, the Phase I RI concluded that IRP Site 5 sediment poses little or no risk to the marine bottom community. The Phase I RI recommended an FS for ecological COPCs in soil and sediment at IRP Site 5 as well as a groundwater assessment to evaluate potential attenuation of ecological COPCs. | TtEMI 2000 |
| June 1994 | During an emergency removal action, approximately 117 cubic yards of soil was removed from above the water table at the former plating-waste pits. Following excavation, a cover of galvanized hardware cloth over chicken wire was installed over the former plating-waste pits to prevent wildlife from contacting any residual contaminants. Confirmation sampling indicated concentrations of copper, nickel, and silver were reduced below their respective TTLC values, while concentrations of cadmium and chromium were still above their TTLC values at the bottom of the excavation. | PRC 1995 |
| 1996 | Laboratory studies to assess whether EK remediation could be an effective treatment option were conducted by ERDC. | DoD 2000 |
| January to February 1997 | Characterization work done to support the EK remediation technology demonstration included collection of surface and subsurface soil samples at 40 points, groundwater samples at 4 points, and surface water samples at 3 points. Additionally, two 60-foot cores were recovered to provide information about subsurface geology and lithology. | LB&M 1997 |
| March and October 1998 | An EK technology demonstration was conducted at Test Cell 1. | TN&A 2003 |
| 1998–1999 | A basewide RI groundwater study was conducted in response to recommendations in the Phase I RI. The groundwater study was designed to evaluate the potential for COPCs to migrate from groundwater to surface water at Mugu Lagoon and the on-base drainage ditches. As part of the investigation, groundwater samples were collected from well MW5-4 at IRP Site 5. Copper was reported in groundwater above the screening value (2.4 µg/L) at well MW5-4 in two out of four sampling events. IRP Site 5 was not identified as a contributor to human-health or ecological risks in surface water. | TtEMI 2002b |
| January to June 1999, November 2000 to June 2003 | In January 1999, ERDC assumed the lead for the EK pilot study and restarted operations. The EK system was temporarily stopped in mid-June 1999 and restarted in November 2000. The system was reconfigured in the spring of 2001 and operated until mid-June 2003. | TN&A 2004 |

Table B-2 (continued)

| Dates | Description | Reference |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 2001 | A screening-level ERA was conducted to evaluate risk from concentrations of COPCs to representative bird and mammalian receptors. Data collected during the Phase I RI was used. No significant ecological risk to vertebrate receptors in the upland areas was identified. The ERA concluded that the song sparrow may be at potential risk from maximum concentrations of chromium, lead, and HMW PAH; the light-footed clapper rail may be at potential risk from maximum concentrations of arsenic, chromium, lead, mercury, selenium, HMW PAH, and total DDTs; the surf scoter may be at potential risk from maximum concentrations of lead, manganese, mercury, selenium, HMW PAHs, and total DDTs; and the great blue heron may be at potential risk from maximum concentrations of lead, mercury, HMW PAHs, and total DDTs. | TtEMI 2001 |
| 2001 | A Phase II RI was conducted to fill data gaps around a former drain line and septic tank at IRP Site 5. Soil samples and groundwater samples from microwells were collected from a total of six locations. The locations were near the former septic tanks and at damaged areas of the drain. One year of quarterly groundwater monitoring was conducted. Analytical data did not indicate the presence of VOC or metals contamination. | Battelle 2002 |
| 2002 | A Tier II ERA was conducted to further evaluate the potential ecological risk posed to birds in the tidal salt marsh and tidal creek habitats by metals, DDTs, and Aroclors in the sediment. Sediment and tissue samples were collected from five new locations and from reference areas. The ERA indicated potential unacceptable risk to individual clapper rails from cadmium and chromium in sediment and potential unacceptable risk to the song sparrow from chromium in sediment. An FS was recommended to address these risks. | TtEMI 2005 |
| August–October 2003 | The EK pilot study test site was decommissioned. Decommissioning included dismantling and demolishing the EK pilot study equipment, excavating and disposing of concentrated metals-contaminated soil, and restoring the area to coastal wetlands. A total of 1,080 cubic yards of soil was excavated from within the plastic barrier wall at the test site. The final depth of the excavation ranged from 6 feet to 14 feet bgs. Confirmation sampling indicated the average final concentrations were below the project decommissioning goals. The excavation was backfilled with clean fill and the plastic barrier wall was removed to 2 feet bgs. | TN&A 2004 |
| 2002, 2004 | Phase II Groundwater RI. Fate and transport modeling simulations indicated that: 1) copper could migrate as far as Mugu Lagoon at concentrations exceeding the CTR criterion, but this was not predicted to occur within the next 700 years; and 2) chromium, nickel, and PCE concentrations exceeding the CTR criteria would not be expected to migrate as far as Mugu Lagoon. The HHRA indicated no unacceptable risk to human health from groundwater COPCs. | BEI 2005 |
| 2008 | The Focused FS Report was developed and evaluated remedial action alternatives to address ecological risks to birds (e.g., song sparrow and light-footed clapper rail) and mammals (e.g., deer mouse) from chemicals of concern in wetland sediment at IRP Site 5. | BEI 2008 |

Acronyms/Abbreviations:

bgs below ground surface
COPC chemical of potential concern
CTR California Toxics Rule
DDD dichlorodiphenyldichloroethane
DDE dichlorodiphenyldichloroethene
DDT dichlorodiphenyltrichloroethane
EK electrokinetic
ERA ecological risk assessment
ERDC Engineering Research and Development Center
FS feasibility study
HHRA human-health risk assessment
HMW high molecular weight
IAS initial assessment study
IRP Installation Restoration Program
µg/L micrograms per liter
PAH polynuclear aromatic hydrocarbon

PCB polychlorinated biphenyl
PCE tetrachloroethene
RI remedial investigation
RME reasonable maximum exposure
SI site inspection
SVOC semivolatile organic compound
TTLC total threshold limit concentration
VOC volatile organic compound

Table B-3
Hazard Quotients for Upland Habitat Species from the Screening-Level ERA

| COPC | HQ (Maximum Dose ^a /High TRV) | HQ (Maximum Dose ^a /Low TRV) |
|-------------------------------------|------------------------------------------------|-----------------------------------------------|
| Deer Mouse^b | | |
| Cadmium | 12.03 | 529 |
| Copper | 0.04 | 9.38 |
| Lead | 0.01 | 1,723 |
| Manganese | 0.09 | 1,065 |
| Nickel | 0.20 | 46.7 |
| American Kestrel^c | | |
| Cadmium | 0.05 | 10.4 |
| Lead | 0.05 | 19.3 |

Notes:

^a the maximum dose was calculated using an average ingestion rate, average body weight, an SUF of 1.0, site maximum soil concentrations, and tissue concentrations estimated using literature BAFs (Sample et al. 1996; U.S. EPA 1998, 1999a); HQ for chromium was not calculated because insufficient data were available to derive TRVs for chromium; chromium was qualitatively evaluated

^b a sediment ingestion rate of 0.000062 kg/day, a prey ingestion rate of 0.0025 kg/day, and a receptor body weight of 0.018 kg was used for the deer mouse

^c a sediment ingestion rate of 0.00010 kg/day, a prey ingestion rate of 0.014 kg/day, and a receptor body weight of 0.11 kg was used for the American kestrel

Acronyms/Abbreviations:

BAF bioaccumulation factor
COPC chemical of potential concern
ERA ecological risk assessment
HQ hazard quotient
kg kilogram
kg/day kilograms per day
SUF site-use factor
TRV toxicity reference value

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Table B-4
Hazard Quotients for Salt Marsh and Tidal Creek Species
from the Screening-Level ERA

| COPC | HQ (Maximum Dose ^a /High TRV) | HQ (Maximum Dose ^a /Low TRV) |
|----------------------------------------------|------------------------------------------------|-----------------------------------------------|
| Song Sparrow^b | | |
| Cadmium | 43.3 | 8,854 |
| Copper | 3.84 | 95.5 |
| Lead | 2.03 | 809 |
| Mercury | 0.83 | 3.81 |
| Nickel | 0.84 | 34.0 |
| Zinc | 0.17 | 1.70 |
| Total DDTs | No TRV | 1.61 |
| Light-Footed Clapper Rail^c | | |
| Arsenic | 1.47 | 5.88 |
| Cadmium | 464 | 94,778 |
| Copper | 3.45 | 85.6 |
| Lead | 13.9 | 5,540 |
| Manganese | 0.31 | 3.07 |
| Mercury | 2.55 | 11.8 |
| Nickel | 9.09 | 368 |
| Selenium | 1.87 | 7.57 |
| Zinc | 1.6 | 16.0 |
| Total DDTs | No TRV | 22.7 |
| Surf Scoter^d | | |
| Arsenic | 0.61 | 2.44 |
| Cadmium | 193 | 39,436 |
| Copper | 1.43 | 33.5 |
| Lead | 5.78 | 2,303 |
| Manganese | 0.13 | 1.28 |
| Mercury | 1.06 | 4.89 |
| Nickel | 3.78 | 153 |
| Selenium | 0.78 | 3.15 |
| Zinc | 0.67 | 6.65 |
| Total DDTs | No TRV | 9.45 |
| Great Blue Heron^e | | |
| Cadmium | 61.0 | 12,469 |
| Copper | 0.46 | 11.5 |
| Lead | 1.85 | 736 |
| Mercury | 0.34 | 1.57 |
| Nickel | 1.20 | 48.7 |
| Selenium | 0.25 | 1.00 |
| Zinc | 0.21 | 2.13 |
| Total DDTs | No TRV | 3.01 |

Table B-4 (continued)

Notes:

^a the maximum dose was calculated using an average ingestion rate, average body weight, an SUF of 1.0, site maximum soil concentrations, and tissue concentrations estimated using literature BAFs (Sample et al. 1996; U.S. EPA 1998, 1999a); HQ for chromium was not calculated because insufficient data were available to derive TRVs for chromium; chromium was qualitatively evaluated

^b a sediment ingestion rate of 0.00053 kg/day, a prey ingestion rate of 0.0061 kg/day, and a receptor body weight of 0.025 kg were used for the song sparrow

^c a sediment ingestion rate of 0.0013 kg/day, a prey ingestion rate of 0.037 kg/day, and a receptor body weight of 0.28 kg were used for the light-footed clapper rail

^d a sediment ingestion rate of 0.0021 kg/day, a prey ingestion rate of 0.067 kg/day, and a receptor body weight of 0.95 kg were used for the surf scoter

^e a sediment ingestion rate of 0.0042 kg/day, a prey ingestion rate of 0.061 kg/day, and a receptor body weight of 2.30 kg were used for the great blue heron

Acronyms/Abbreviations:

| | |
|--------|---------------------------------|
| BAF | bioaccumulation factor |
| COPC | chemical of potential concern |
| DDT | dichlorodiphenyltrichloroethane |
| ERA | ecological risk assessment |
| HQ | hazard quotient |
| kg | kilogram |
| kg/day | kilograms per day |
| SUF | site-use factor |
| TRV | toxicity reference value |

Table B-5
Chemicals Identified for Further Evaluation by the Screening-Level ERA

| Vertebrate Receptor | Chemicals Identified for Further Evaluation |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Upland | |
| Deer mouse | None |
| American kestrel | None |
| Wetland | |
| Song sparrow | cadmium*, chromium, copper*, lead, mercury, nickel*, zinc*, HMW PAHs, total DDTs |
| Light-footed clapper rail | arsenic, cadmium*, chromium, copper*, lead, manganese, mercury, molybdenum, nickel*, selenium, silver, zinc*, HMW PAHs, total DDTs |
| Surf scoter | arsenic, cadmium*, copper*, lead, manganese, mercury, molybdenum, nickel*, selenium, zinc*, HMW PAHs, total DDTs |
| Great blue heron | cadmium*, copper*, lead, mercury, molybdenum, nickel*, selenium, zinc*, HMW PAHs, total DDTs |

Notes:

* maximum concentrations of these metals are as associated with the former plating-waste pits at IRP Site 5, which make up a small area of the site; at the time the screening-level ERA was conducted, the former plating-waste pits were undergoing an EK pilot study; at the conclusion of the EK pilot study, the former plating-waste pits were excavated to 6 to 14 feet bgs

Acronyms/Abbreviations:

bgs below ground surface
DDT dichlorodiphenyltrichloroethane
EK electrokinetic
ERA ecological risk assessment
HMW high molecular weight
IRP Installation Restoration Program
PAH polynuclear aromatic hydrocarbon

Table B-6
Hazard Quotients for Song Sparrow from the ERA Addendum

| COPC | Salt Marsh Habitat | | | |
|------------|--------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------|
| | HQ (Dose ^a /High TRV) Diet: 50% Crab and 50% Pickleweed | HQ (Dose ^a /Low TRV) Diet: 50% Crab and 50% Pickleweed | HQ (Dose ^a /High TRV) Diet: 100% Pickleweed | HQ (Dose ^a /Low TRV) Diet: 100% Pickleweed |
| Cadmium | 0.19 | 39.32 | 0.19 | 39.53 |
| Chromium | 4.68 | 23.39 | 4.67 | 23.34 |
| Copper | 0.31 | 7.58 | 0.18 | 4.54 |
| Lead | 0.12 | 49.07 | 0.12 | 47.45 |
| Nickel | 0.067 | 2.72 | 0.068 | 2.75 |
| Selenium | 0.87 | 3.53 | 0.43 | 1.74 |
| Total DDTs | 0.020 | 4.25 | — ^b | — |

Notes:

^a the dose was calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), an SUF of 1.0, and the lesser of the 95 percent UCL of the arithmetic mean or the maximum concentration for site tissue values and sediment values (the mean was used when the 95 percent UCL could not be calculated because of low detection frequency)

^b dash indicates no HQs exceeded 1.0

Acronyms/Abbreviations:

COPC chemical of potential concern
DDT dichlorodiphenyltrichloroethane
ERA ecological risk assessment
HQ hazard quotient
kg kilogram
kg/day kilograms per day
SUF site-use factor
TRV toxicity reference value
UCL upper confidence limit

Table B-7
Hazard Quotients for Great Blue Heron from the ERA Addendum

| COPC | Salt Marsh Habitat | | Tidal Creek Habitat | |
|------------|-------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------|
| | HQ (Dose*/High TRV) Diet: 75% Mollusk and 25% Crab | HQ (Dose*/Low TRV) Diet: 75% Mollusk and 25% Crab | HQ (Dose*/High TRV) Diet: 75% Mollusk and 25% Crab | HQ (Dose*/Low TRV) Diet: 75% Mollusk and 25% Crab |
| Cadmium | 0.014 | 2.87 | 0.0084 | 1.73 |
| Lead | 0.0056 | 2.24 0.0056 | | 2.22 |
| Total DDTs | 0.022 | 4.77 0.022 | | 4.77 |

Notes:

*The dose was calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), an SUF of 1.0, and the lesser of the 95 percent UCL of the arithmetic mean or the maximum concentration for site tissue values and sediment values (the mean was used when the 95 percent UCL could not be calculated because of low detection frequency).

Acronyms/Abbreviations:

COPC chemical of potential concern
DDT dichlorodiphenyltrichloroethane
ERA ecological risk assessment
HQ hazard quotient
kg kilogram
kg/day kilograms per day
SUF site-use factor
TRV toxicity reference value
UCL upper confidence limit

Table B-8
Hazard Quotients for Light-Footed Clapper Rail from the ERA Addendum

| | Salt Marsh and Tidal Creek Habitats | | | |
|-------------|----------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------|
| COPC | HQ (Maximum Dose*/High TRV) Diet: 100% Crab | HQ (Maximum Dose*/Low TRV) Diet: 100% Crab | HQ (Average Dose*/High TRV) Diet: 100% Crab | HQ (Average Dose*/Low TRV) Diet: 100% Crab |
| Cadmium | 1.14 | 233.21 | 0.026 | 5.37 |
| Chromium | 10.13 | 50.64 | 0.47 | 2.36 |
| Copper | 0.24 | 5.99 | 0.13 | 3.21 |
| Lead | 0.20 | 81.11 | 0.023 | 9.30 |
| Nickel | 0.093 | 3.75 | 0.013 | 0.52 |
| Selenium | 0.55 | 2.23 | 0.50 | 2.03 |
| Total DDTs | 0.015 | 3.30 | 0.011 | 2.37 |

Note:

*The doses were calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), and an SUF of 1.0; the maximum dose used the maximum site sediment and tissue concentrations; the average dose used the 95 percent UCL of the arithmetic mean or the mean for site sediment values if the 95 percent UCL could not be calculated due to low frequency of detection, and the 95 percent UCL or mean sites tissue if the 95 percent UCL was greater than the maximum.

Acronyms/Abbreviations:

COPC chemical of potential concern
DDT dichlorodiphenyltrichloroethane
ERA ecological risk assessment
HQ hazard quotient
kg kilogram
kg/day kilograms per day
SUF site-use factor
TRV toxicity reference value
UCL upper confidence limit

Table B-9
Hazard Quotients for Surf Scoter from the ERA Addendum

| COPC | Tidal Creek Habitat | |
|------------|----------------------------------------------|---------------------------------------------|
| | HQ (Dose*/High TRV) Diet: 100% Mollusk | HQ (Dose*/Low TRV) Diet: 100% Mollusk |
| Total DDTs | 0.0069 | 1.49 |

Notes:

*The dose was calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), an SUF of 1.0, and the lesser of the 95 percent UCL of the arithmetic mean or the maximum concentration for site tissue values and sediment values (the mean was used when the 95 percent UCL could not be calculated because of low detection frequency).

Acronyms/Abbreviations:

COPC chemical of potential concern
DDT dichlorodiphenyltrichloroethane
ERA ecological risk assessment
HQ hazard quotient
kg kilogram
kg/day kilograms per day
SUF site-use factor
TRV toxicity reference value
UCL upper confidence limit

Table B-10
Estimated Costs for Alternative 3

| Cost Element^{a,b,c} | Calendar Year 1 2009 | Calendar Year 2 2010 | Row Total |
|-----------------------------------------------------|-------------------------------------|-------------------------------------|----------------------|
| Removal Action Design | \$84,000 | | \$84,000 |
| Excavation and Backfill (Capital) | | \$304,000 | \$304,000 |
| Confirmation Sampling (Capital) | | \$13,000 | \$13,000 |
| Backfill Sampling (Capital) | | \$24,000 | \$24,000 |
| Chemical Profiling of Stockpiled Sediment (Capital) | | \$5,000 | \$5,000 |
| Dewatering (Capital) | | \$92,000 | \$92,000 |
| Off-Site Disposal (Capital) | | \$534,000 | \$534,000 |
| Removal Action Report (Capital) | | \$79,000 | \$79,000 |
| | | | |
| Sub-Total (2007 Costs) | \$84,000 | \$1,051,000 | \$1,135,000 |
| Escalation Factor | 1.0394 | 1.0394 | |
| Sub-Total (2009 Costs) | \$87,310 | \$1,092,409 | \$1,179,719 |
| Contingency (20 percent) | \$17,462 | \$218,482 | \$235,944 |
| Sub-Total (2009 Costs with Contingency) | \$104,772 | \$1,310,891 | \$1,415,663 |
| Discount Factor^d | 0.973 | 0.946 | |
| Present Value^e | \$101,943 | \$1,240,103 | \$1,342,000 |

Notes:

- ^a The costs are rounded off to nearest thousands.
- ^b The costs include contractor markups, or overhead and profit. RACER™ 2007 Markup Template was used to calculate Marked-up Cost.
- ^c The costs for professional labor are included in the estimate.
- ^d Discount factor was calculated using a real discount rate of 2.8 percent per the Office of Management and Budget Circular A-94 (OMB 2008).
- ^e The value reflects present worth as of 2009.

Table B-11
Assumptions/Parameters for Cost Estimation of Alternative 3:
Excavation of Sediment with Off-Site Treatment and Disposal

| Cost Element | Key Assumptions/Parameters |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAPITAL COSTS | |
| Excavation and Backfill | <ol style="list-style-type: none"> 1. Source of cost data: RACER™ and Vendor quote/budgetary estimate. 2. Estimated volume of contaminated sediment to be excavated = 2,700 bank cubic yards |
| Dewatering | <ol style="list-style-type: none"> 1. Source of cost data: RACER™ and Vendor quote/budgetary estimate. 2. Includes cost of a concrete containment pad and treatment of pumped water through a GAC 3. Estimated volume of sediment to be dewatered: 3,400 cy (assuming a fluff factor of 1.25) 4. No of water samples generated as a result of dewatering to be analyzed: 20 5. Analytes Assumed: Metals and VOCs |
| Chemical Profiling of Stockpiled Sediment | <ol style="list-style-type: none"> 1. Source of cost data: RACER™ and Vendor quote/budgetary estimate. 2. No of sediment samples to be analyzed: 14. 3. Analyses Assumed: Metals. |
| Off-Site Disposal | <ol style="list-style-type: none"> 1. Source of cost data: RACER™ and Vendor quote/budgetary estimate 2. Unit Cost for off-site transportation and disposal of RCRA hazardous waste requiring stabilization: \$114 per ton 3. Unit cost for off-site transportation and disposal of non-hazardous sediment: \$53.4 per ton 4. Estimated weight of sediment requiring off-site disposal: 4,556 tons 5. Cost is based on the characterization of 15 percent of waste as RCRA hazardous and 85 per cent as non-hazardous. |
| Confirmation Sampling | <ol style="list-style-type: none"> 1. Source of cost data: RACER™ and Vendor quote/budgetary estimate 2. Number of confirmation samples: 30 (includes samples collected for quality assurance/quality control [QA/QC]) 3. Analyses assumed: Metals |
| Backfill Sampling | <ol style="list-style-type: none"> 1. Source of cost data: RACER™ and Vendor quote/budgetary estimate 2. Number of backfill samples: 10 (includes samples collected for QA/QC) 3. Analyses assumed: VOCs, SVOCs, Metals PAHs, pH, Pesticides, PCBs, Chlorinated herbicides, and TPH |

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APPENDIX C

NOTICE OF EXEMPTION

NOTICE OF EXEMPTION

To: Office of Planning and Research
State Clearinghouse
P.O. Box 3044, 1400 Tenth Street, Room 212
Sacramento, CA 95812-3044

From: Department of Toxic Substances Control (DTSC)
Cleanup Program – Cypress
5796 Corporate Avenue
Cypress, California 90630-4700

Project Title: Interim Removal Action, Wetlands Sediment

Project Location: Inside Site 5, Naval Base Ventura County Point Mugu

County: Ventura

Project Description:

The Navy will excavate inside Site 5, in a 0.24 acres area identified as the Area of Ecological Concern (AOEC) to six (6) feet below ground surface to remove and dispose 2,700 cubic yards of contaminated sediment. AOEC will then be backfilled and reconstituted back to native salt marsh habitat for wildlife. The Department of Toxic Substances Control (DTSC), together with Regional Water Quality Control Board (RWQCB) and Department of Fish Game (DFG), have concurred with the proposed approach for this project. The Navy will conduct this interim removal action under the *Action Memorandum Non-Time-Critical Removal Action IRP Site 5, Wetlands Sediment* to eliminate/minimize potential ecological risks to birds such as the song sparrow and light-footed clapper rail (a special-status species), and small mammals such as the deer mouse. This removal action is conducted pursuant to the Comprehensive Response Compensation, and Liability Act (CERCLA).

Project Background:

The Mugu Lagoon intertidal mudflat, which includes parts of Site 5, is currently and will remain a wildlife refuge and habitat. AOEC is very small compared to the mudflat areas of Site 5, only 0.24 acre (<0.7%) of the mudflat's 36.57 acres. AOEC has residual elevated concentrations of cadmium and chromium in the sediment from past metal plating waste discharges which ended in 1978. An ecological risk assessment concluded that elevated chromium concentrations pose unacceptable risk to the song sparrow and light-footed clapper rail, while elevated cadmium to the light-footed clapper rail as well. In addition, copper, lead, nickel, and silver levels in sediment must also be addressed to be protective of small mammals such as the deer mouse. The primary exposure pathways by which both the birds and small mammals may come in contact with the chemicals of concern (COC) include ingestion of contaminated sediments and feeding upon prey (e.g., crab) that have been contaminated. Currently, there is a potential for redistribution of COC-impacted sediment by bioturbation from burrowing organisms and a potential for migration of COC-impacted sediment by surface water runoff.

According to the human health risk assessment, concern for Site 5 is for future industrial workers and the risk is within the acceptable range. The ecological risk assessment identified no other ecological concerns for Site 5 except for AOEC. The sediment management objectives (SMO) for AOEC and the investigation/removal action are summarized below:

| Site 5 AOEC (Wetlands Sediment) Investigation and Proposed Removal Action Summary | | |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------|
| Major chemical risk driver(s) in sediment for human health | Not Applicable (NA) | |
| Major chemical risk driver(s) in groundwater for human health | NA | |
| Human health risk from existing conditions | NA | |
| Major chemical risk driver(s) in sediment for wildlife | Cadmium, chromium, copper, lead, nickel, and silver | |
| Major chemical risk driver(s) in groundwater for wildlife | None identified in ecological risk assessment. | |
| Ecological risk | Unacceptable risk to special status birds and small mammals. | |
| Removal action required? | Yes. | |
| Purpose of proposed removal action | To reduce toxicity, mobility, and volume of COC-impacted sediment to protect birds and small mammals. | |
| Cleanup goal | Chemicals of Concern | Sediment Management Objectives (mg/kg) |
| | cadmium | 7.56 |
| | chromium | 115 |
| | copper | 51.3 |
| | lead | 260 |
| | nickel | 62.98 |
| | silver | 5.6 |

Site 5 consists of two (2) distinct areas, northern and southern, separated by Beach Road. AOEC is located in the northern area, near Beach Road, and about 800 feet from the Mugu Lagoon. A marsh creek, originating at Mugu Lagoon, also cuts through AOEC. Most of the northern area consists of salt marsh, tidal creek channels, and intertidal mudflats. They are currently and will continue to be wildlife refuge and habitat. AOEC is an intertidal salt marsh habitat area at the upper edge of high tide range that gets inundated, typically <1 foot deep by tides, several time a week on average. However, the rising and receding of tidal water around AOEC are slow and gentle due to the combination of higher elevation, long distance from the lagoon, and hydraulic properties of the mudflat sediment. The southern area, which is not part of this project, is currently used by the Navy and consists of two (2) unoccupied, single story, metal storage buildings, and one (1) chain-link fenced storage yard. The ground surface in this area consists of pavement interspersed with non-native grassland habitat.

Between 1947 and 1978, plating wastes were disposed in two (2) pits at the southern edge of AOEC. The heavily contaminated sediments in the pits and their immediate vicinities were removed through two (2) previous removal actions in 1994 and 2003. That area was then backfilled and restored to its native condition. However, sediment with COCs exceeding the SMOs exists at locations sampled adjacent to the former pit excavation area—now circumscribed inside the AOEC.

The only known prehistoric archaeological location on the Base is at Site 8, according to *"From Spanish Land Grants to World War II: An Overview of Historic Resources at the Naval Air Weapons Station, Point Mugu, California"* (Swanson, 1994) and *"Life in the Margins: Archaeological Excavations at Point Mugu (CA-VEN-187/256), Naval Base Ventura County, California"* (Beardsley, Felicia R. and John G. Douglass, 2004)". Site 8 is located a short distance beyond the end of an active runway and is more that 1 ¼ miles away from AOEC.

Project Activities:

The Navy will excavate to six (6) feet deep in AOEC. An average of 25 trucks per day for approximately 7 days will be utilized to transport the 2,700 cubic yards of contaminated sediment for off site disposal. The estimated duration to complete the excavation and restoration is about four (4) months. Following excavation, confirmation samples will be taken to ensure that the SMO levels are attained. AOEC will then be backfilled with clean sediments obtained from other locations on the Base. Surficial portions of the backfill will be designed and constructed similar to the surrounding sediment bed, with the intent that the salt marsh ecological community would re-colonize the reconstituted habitat.

The Navy anticipates that the COC-impacted sediment will be removed through this interim step. If post excavation sediment concentrations in the removal action area do not meet the SMOs, additional response action may be required.

Name of Public Agency Approving Project: Department of Toxic Substances Control

Name of Person or Agency Carrying Out Project: Department of The Navy

Exemption Status: (check one)

- ☐ Ministerial [PRC, Sec. 21080(b)(1); CCR, Sec. 15268]
- ☐ Declared Emergency [PRC, Sec. 21080(b)(3); CCR, Sec.15269(a)]
- ☐ Emergency Project [PRC, Sec. 21080(b)(4); CCR, Sec.15269(b)(c)]
- ☐ Categorical Exemption: [State type and section number]
- ☐ Statutory Exemptions: [State code section number]
- ☒ General Rule [CCR, Sec. 15061(b)(3)]

Exemption Title: With certainty, no possibility of a significant effect on the environment.

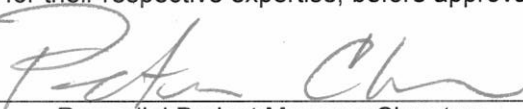
Reasons Why Project is Exempt:

1. AOEC at Site 5 is located within the boundaries and in an unpopulated area of Naval Base Ventura County Point Mugu—an active military installation next to the Pacific Ocean. The nearest populated location is the on-base residential housing area more than 1½ miles due north. Public access to the Base is restricted by fencing and guarded security entrance points.
2. AOEC is more than 1¼ miles away from Site 8, the only prehistoric archeological resources on the Base. There is no expectation that any work at AOEC will affect Site 8. If suspected resources are unexpectedly found at AOEC during the removal activities, the activities will stop and cultural resources protection procedures outlined in the Cultural/Archeological Resources Protection Plan will be put into effect.

3. The predominant wind direction is from the west as reported at the nearby Oxnard Airport. Perimeter air monitoring as well as personnel air monitoring will be performed for fugitive dusts. The work will only be conducted during dry weather. Earthwork (e.g., excavation, backfill, grading), loading and decontamination activities will stop when the wind speed exceeds 25 miles per hour.
4. Air monitoring for fugitive dust will be performed during the excavation and backfilling activities to assure compliance with the approved Health and Safety Plan and to comply with Ventura County Air Pollution Control District Rule 50 (Opacity), Rule 51 (Nuisance), Rule 55 (Fugitive Dust), and Rule 62.1 (Hazardous Materials). Engineering controls, consisting primarily of water spraying trucks will be used to comply with Rules 50, 51, 55 and 62.1.
5. Although tidally connected to Mugu Lagoon through a marsh creek, AOEC is about 800 feet from the Mugu Lagoon and the lagoon opening to the Pacific Ocean at this point is about 0.7 mile away. The rising and receding of tidal water at AOEC are slow and gentle, however, due to the combination of being at higher elevation, long distance from the lagoon, and hydraulic properties of the mudflat sediment. AOEC is flooded, typically <1 foot deep, several times a week on average from tides. This inundation during excavation can be avoided by making AOEC a "dry" zone, using proven engineering technologies (e.g., an inflatable barrier system) that will prevent tidal water from entering into AOEC.
6. The Navy has also successfully completed a 1.5-acre sediment excavation in an environmentally sensitive wetland area at Naval Weapons Station Seal Beach Detachment Concord—Taylor Boulevard Bridge Disposal Site (Site 30), Military Ocean Terminal Concord. AOEC is tiny by comparison, only 0.24 acres (about the lot size of a small home). The Navy will employ similar DTSC and Regional Water Quality Control Board approved best management practices at AOEC. They include but not limited to, where appropriate and needed, interlocking base to provide a working platform, temporary aqua-barriers, etc., to prevent disturbing the adjoining sediment of the salt marsh habitat. Because of the small size of AOEC, the Navy will deploy excavation equipment sized to minimize intrusion into the area of excavation.
7. This proposed activity is consistent with the Navy's Integrated Natural Resource Management Plan (INRMP) and the ongoing wetland restoration projects at the Base. Various endangered species surveys are required by the INRMP. The surveys are coordinated with California Department of Fish and Game (CDFG), and U.S. Fish and Wildlife Service (USFWS) to update the California Natural Diversity Database (CNDDB) which inventories the status and locations of rare plants and animals. The CNDDB results identified special status bird species: Western Snowy Plover, California Least Tern, California Brown Pelican, Light-Footed Clapper Rail, Belding's Savanna Sparrow, Peregrine Falcon, and Least Bell's Vireo; and a special status plant species: Salt Marsh Bird's-Beak within the Point Mugu quadrangle. All confirmed nesting locations are accurately recorded and monitored throughout the year. A 50-foot habitat buffer surrounding the proposed excavation perimeter will be established and clearly marked. A qualified biologist/ecologist or the base wildlife manager, in consultation with CDFG and USFWS, will monitor both the excavation and buffer areas throughout the excavation activities to provide advice on how to prevent disturbance to the protected wildlife species.
8. Prior to start of excavation activities, wildlife and plants at AOEC and the vicinity habitat will be re-surveyed to assess the presence of special status species and plants. In the event that any of the special-status species nest in the vicinity of AOEC, constraints to protect them during the nesting season will be implemented. Nesting season (March 1st through September 15th) constraints are based on proximity of activities to the nests. Activity constraints including time-of-day, noise limits and/or other conditions may be imposed. If necessary, the removal action may even be prohibited during the nesting season. Based on past experience, the base wildlife manager has determined that no constraints for the specific status species will be required outside of the nesting season.
9. There is ample space, not in the wetland, for logistical support such as truck and equipment staging and stockpiling of excavated sediment in the nearby sparsely occupied industrial area. AOEC is at the edge of the marsh next to the north-south dividing Beach Road in an unpopulated area of the Base.
10. The excavated sediment will be temporary stockpiled at high ground in the industrial area near AOEC. The stockpile area will be constructed, using a double liner system, within the exclusion zone at Site 5 away from the salt marsh habitat. The stockpile area is used to temporarily stage the excavate sediment pending drying and load into trucks for off site disposal. Recycling of the excavated sediment is not allowed for this project, all excavated sediments will be transported to an appropriate disposal facility—either Class 1 or Class 2.
11. The morning truck arrivals will be scheduled before the peak commute hours of 7:00 to 8:30 a.m. and afternoon departures before 3:30 p.m. Prior to departing from AOEC, all trucks will be covered with tarp and the tires and sides will be swept clean of any residual soils in a designated decontamination area. Stabilized entrance/exit at

AOEC will be constructed if necessary. The Waste Management Plan will specify that road inspections and sweeping will be performed as needed. All excavated materials will be handled by licensed waste haulers, in compliance with applicable laws and regulations.

12. After chemical profiling, all sediments that are classified as hazardous waste will be manifested, and transported in covered trucks in accordance with Department of Transportation requirements to an appropriate Class 1 disposal facility. Sediments that are classified as non-hazardous waste will be accompanied with a bill of lading, and transported in covered trucks in accordance with Department of Transportation requirements to an appropriate Class 2 disposal facility. The decanted water will also be disposed in a similar manner. After a final inspection, the trucks that are headed for offsite disposal will be weighed, accompanied with either a manifest or bill of lading, inspected once more, and released. The trucks will pass only areas of military-industrial operations between Site 5 and the Las Posas gate. The transportation route consists of well maintained, traffic controlled roads and freeways. Leaving the Base at Las Posas gate, the trucks will proceed north on Las Posas Road (a major county road) until they reach Highway 101 approximately 8 miles north of the Base. There are no schools, emergency clinics, or hospitals adjacent to the route between the Base and Highway 101.
13. An average of 25 trucks per day for approximately 7 days will be utilized to complete the transportation. The excavated area will be sampled to ensure that the SMO levels have been attained, and then backfilled with clean sediments from other locations on the Base to reconstitute the AOEC back to a wildlife habitat.
14. The Navy will prepare a detailed implementation work plan which will address all aspects of the removal and restoration activities, worker health and safety, and environmental/cultural/archeological resources protection. This plan will be reviewed by a multi-discipline team within DTSC, and other regulatory agencies (e.g. RWQCB and DFG) for their respective expertise, before approval by DTSC.



Remedial Project Manager Signature

9/30/10

Date

Peter Chen

Remedial Project Manager Name

Brownfields and Environmental Restoration
Program – Cypress

Program Title

(714) 484-5431

Phone #

TO BE COMPLETED BY OPR ONLY

Date Received For Filing and Posting at OPR:

APPENDIX D

ENGINEERING EVALUATION/COST ANALYSIS



Final

**Engineering Evaluation/Cost Analysis
Installation Restoration Program Site 5
Wetlands Sediment**

**NAVAL BASE VENTURA COUNTY
POINT MUGU, CALIFORNIA**

November 2009

Prepared for:

**Naval Facilities Engineering Command, Southwest
San Diego, California**

Prepared by:

**Insight, Inc.
3010 East Miraloma Avenue
Anaheim, CA 92806**

In Association With:

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Prepared under:

**Naval Facilities Engineering Command
Contract No. N68711-04-D-1107
DCN: IEEC-1107-0008-0006**

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EXECUTIVE SUMMARY

This engineering evaluation/cost analysis (EE/CA) addresses non-time-critical removal action (NTCRA) alternatives for wetland sediment contamination at Installation Restoration Program (IRP) Site 5, the Old Area 6 Shops, located on Naval Base Ventura County (NBVC) Point Mugu. This EE/CA has been prepared in accordance with the National Oil and Hazardous Pollution Substances Contingency Plan (NCP) (40 Code of Federal Regulations [CFR], Part 300), including but not limited to the provisions of 40 CFR Section 300.415(b)(4)(1). This document presents the evaluation of removal action alternatives based on several criteria and is not intended to present detailed designs or to be used as a removal action work plan. The EE/CA has been prepared by AECOM Technical Services (formally Earth Tech, Inc.) under contract to Insight, Inc. on behalf of the United States (U.S.) DON, Naval Facilities Engineering Command Southwest (NAVFAC SW), in accordance with Contract No. N68711-04-D-1107.

The California Health and Safety Code 25323, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the NCP (40 CFR Part 300) define removal actions as the cleanup or removal of released hazardous substances, actions to monitor the threat or release of hazardous substances, and actions to mitigate or prevent damage to public health or welfare, or the environment. According to NCP criteria, no action is needed where risk levels are below 10^{-6} , and action is required where risk levels are above 10^{-4} . A risk management decision to determine the appropriate action is made when risk levels are between 10^{-6} and 10^{-4} . This decision is based on site-specific information.

NBVC Point Mugu is located in Point Mugu, Ventura County, California, approximately 50 miles northwest of Los Angeles. NBVC Point Mugu is bordered by Highway 1 on the north and east, the Pacific Ocean on the south and west, and two game reserves on the west and northwest. IRP Site 5 is located just west of Laguna Road on a sand spit separating Mugu Lagoon and the Pacific Ocean.

The following environmental activities have been conducted at the IRP Site 5:

- Initial Assessment Study (IAS) (SCS and Landau Associates 1985)
- Site Inspection Study (Fugro-McClelland 1991)
- Phase I Remedial Investigation (RI) (TtEMI 2000)
- Emergency Removal Action (PRC 1995)
- Basewide Groundwater RI (TtEMI 2002)
- Electrokinetic (EK) Pilot Study (TN&A 2004)
- Screening-Level Ecological Risk Assessment (ERA) (TtEMI 2001)
- Phase II RI (Battelle 2002)
- Final ERA Addendum (TtEMI 2005)
- Decommissioning of the EK Pilot Study (TN&A 2004)
- California Toxics Rule Criteria (BEI 2005)
- Feasibility Study (FS) (BEI 2008)

Based on analytical results from previous investigations, residual or confirmation sampling results, reported excavation limits of the emergency removal action, and the EK pilot study decommissioning effort, it has been determined that the current site chemicals of concern (COCs) concentrations based on 95 percent upper confidence limit (UCL) of the mean exceed the sediment management objectives (SMOs) for cadmium, chromium, copper, lead, nickel, and silver at some sampling locations. These sampling locations are near the former plating-waste pits, within approximately 100 feet of the EK

decommissioning excavation, and the area encompassing these sampling locations is designated as Area of Ecological Concern (AOEC) 1.

Based on the results of the ERA Addendum, the sediment within the AOEC 1 footprint with chromium concentrations exceeding its SMO poses significant or immediate risk to the song sparrow and light-footed clapper rail, a special-status species. In addition, the elevated cadmium concentrations at IRP Site 5 also pose significant or immediate risk to the light-footed clapper rail. Ecological risks from media other than sediment and chemicals of potential concern other than cadmium and chromium, ecological risk to receptors other than the light-footed clapper rail and the song sparrow, and risks to human health were determined not to warrant further action (TtEMI 2000, 2005; BEI 2005). However, during development of the Draft EE/CA Report, regulators requested that copper, lead, nickel, and silver be addressed in addition to cadmium and chromium and that removal goals and alternatives presented in the EE/CA be protective of small mammals in addition to birds. It was noted that the IRP Site 5 ecological risk assessments did not include data from some of the most contaminated areas because at the time the former plating-waste pits were covered with hardware cloth and a complete exposure pathway did not exist. Therefore, given the potential of exposing on-site receptors to elevated COC concentrations, a response that either eliminates or minimizes the exposure is required for sediment at IRP Site 5.

The purpose of the EE/CA is to identify and analyze alternative removal action alternatives to address ecological risks to birds (i.e. song sparrow and light-footed clapper rail) and small mammals (i.e. deer mouse) from COCs in wetland sediment at the IRP Site 5. Also, because the wetland sediment at IRP Site 5 is adjacent to Mugu Lagoon and is connected to Mugu Lagoon by a tidal creek, the alternatives should ensure that the wetland sediment at IRP Site 5 is not a source of non protective levels of chromium to Mugu Lagoon. Mugu Lagoon is designated as IRP Site 11 and has a remediation goal of 81 milligrams per kilogram for chromium. Three alternatives were identified and considered:

- Alternative 1 – No Action
- Alternative 2 – Institutional Controls
- Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal

Each of these alternatives was evaluated to assess the following:

- Effectiveness to achieve the following removal action objective:
 - Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium, 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment.
- Compliance with applicable or relevant and appropriate requirements
- Implementability including technical and administrative feasibility.
- Cost-effectiveness.

Based on this analysis, the DON recommends Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal. This alternative will reduce toxicity, mobility, and volume of contaminated sediment at the site, providing long-term effectiveness and protection to the environment. This alternative meets the removal action objectives and, presuming it is easily implementable, it provides the best balance between costs and overall effectiveness. In addition, this alternative is intended to be consistent with the final remedy/response action for the site.

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ACRONYMS AND ABBREVIATIONS

| | |
|-------------------|-----------------------------------------------------------------------|
| AOEC | area of ecological concern |
| ARAR | applicable or relevant and appropriate requirement |
| BAF | bioaccumulation factor |
| BEI | Bechtel Environmental National, Inc. |
| bgs | below ground surface |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| C.F.R. | Code of Federal Regulations |
| COC | chemical of concern |
| COPC | chemical of potential concern |
| CTR | California Toxic Rule |
| DDD | dichlorodiphenyldichloroethane |
| DDE | dichlorodiphenyldichloroethene |
| DDT | dichlorodiphenyltrichloroethane |
| DoD | Department of Defense |
| DON | Department of the Navy |
| DTSC | Department of Toxic Substances Control |
| EE/CA | engineering evaluation/cost analysis |
| EK | electrokinetic |
| ERA | ecological risk assessment |
| ERDC | Engineering Research and Development Center |
| ERL | effects-range low |
| ERM | effects-range median |
| °F | degrees Fahrenheit |
| FE | federal endangered species |
| FT | federal threatened species |
| FS | feasibility study |
| HHRA | human-health risk assessment |
| HMW | high molecular weight |
| HQ | hazard quotient |
| IAS | initial assessment study |
| IC | institutional control |
| INRMP | Integrated Natural Resource Management Plan |
| IRP | Installation Restoration Program |
| kg | kilogram |
| kg/day | kilogram per day |
| m ³ /h | cubic meter per hour |
| mg/kg | milligrams per kilogram |
| NA | not applicable |
| NAS | Naval Air Station |
| NAVFAC SW | Naval Facilities Engineering Command Southwest |
| NAWS | Naval Air Weapons Station |
| NBVC | Naval Base Ventura County |
| NC | not calculated |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NTCRA | non-time-critical removal action |
| O&M | operation and maintenance |
| ORNL | Oak Ridge National Laboratory |
| PAH | polynuclear aromatic hydrocarbon |
| PCB | polychlorinated biphenyl |

| | |
|-------|---------------------------------------------------|
| RACER | Remedial Action Cost Engineering and Requirements |
| RCRA | Resource Conservation and Recovery Act |
| RI | remedial investigation |
| RME | reasonable maximum exposure |
| SE | State of California endangered species |
| SI | site inspection |
| SMO | sediment management objective |
| SUF | site-use factor |
| SVOC | semivolatile organic compound |
| TDS | total dissolved solids |
| TRV | toxicity reference value |
| UCL | upper confidence limit |
| TBC | to be considered |
| TTLC | total threshold limit concentration |
| U.S. | United States |
| EPA | Environmental Protection Agency |
| USGS | United States Geological Survey |
| VOC | volatile organic compound |
| µg/L | micrograms per liter |

1. INTRODUCTION

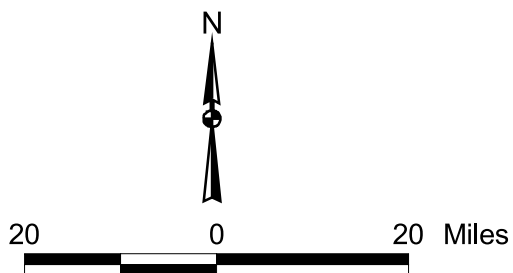
This engineering evaluation/cost analysis (EE/CA) addresses non-time-critical removal action (NTCRA) alternatives for wetland sediment contamination at Installation Restoration Program (IRP) Site 5, the Old Area 6 Shops, located on Naval Base Ventura County (NBVC) Point Mugu. NBVC Point Mugu is located in Point Mugu, Ventura County, California, approximately 50 miles northwest of Los Angeles (Figure 1-1). NBVC Point Mugu is bordered by Highway 1 on the north and east, the Pacific Ocean on the south and west, and two game reserves on the west and northwest (Figure 1-2). IRP Site 5 is located just west of Laguna Road on a sand spit separating Mugu Lagoon and the Pacific Ocean (Figure 1-3). The EE/CA has been prepared by AECOM Technical Services (formally Earth Tech, Inc.) under contract to Insight, Inc. on behalf of the United States (U.S.) DON, Naval Facilities Engineering Command Southwest (NAVFAC SW), in accordance with Contract No. N68711-04-D-1107.

This EE/CA was prepared in accordance with guidance from the U.S. Environmental Protection Agency (EPA) and the DON on conducting NTCRAs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (U.S. EPA 1993) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300.415). Removal actions are defined to include "...the cleanup or removal of released hazardous substances from the environment, such actions may necessarily be taken in the event of the threat of release of hazardous substance into the environment, such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal of removal material, or the taking of such action as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release." The U.S. EPA has classified removal action into three types based on the circumstances surrounding the release or threat of release: emergency, time-critical, and non-time-critical. The removal action at the IRP Site 5 wetland sediment has been determined to be a non-time-critical removal because the release or threat of release of contamination is not critical based on a streamlined risk evaluation and site considerations. This NTCRA will involve a planning period of more than 6 months before on-site activities commence.

Under 40 CFR 300.415 of the NCP, the lead agency is required to prepare an EE/CA to address the implementability, effectiveness, and cost of a NTCRA, and to evaluate applicable or relevant and appropriate requirements (ARARs). This removal action is taken pursuant to CERCLA and the NCP under the delegated authority of the Office of the President of the U.S. by Executive Order 12580. This EE/CA will be used as the basis for a future CERCLA removal action. As the lead agency, the DON has final approval authority of the recommended alternative selected. The DON is working in cooperation with the California EPA, Department of Toxic Substances Control (DTSC), and Regional Water Quality Control Board – Los Angeles Region, to implement this action. In addition, the DON is working in cooperation with California Department of Fish and Game through DTSC to implement this action.

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IRP Site 5 EE/CA

Figure 1-1

Project Location Map

NBVC Point Mugu, Point Mugu, California

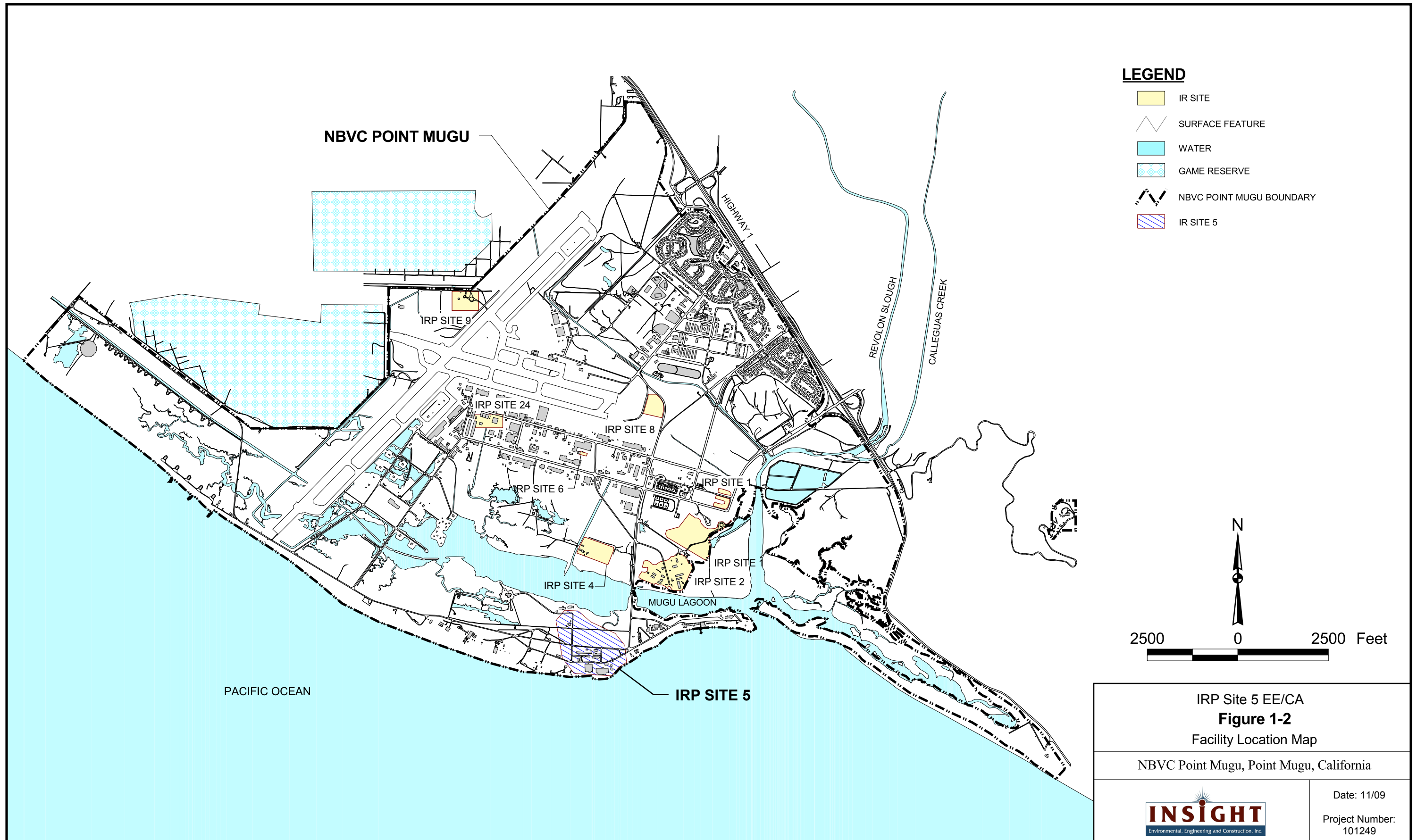


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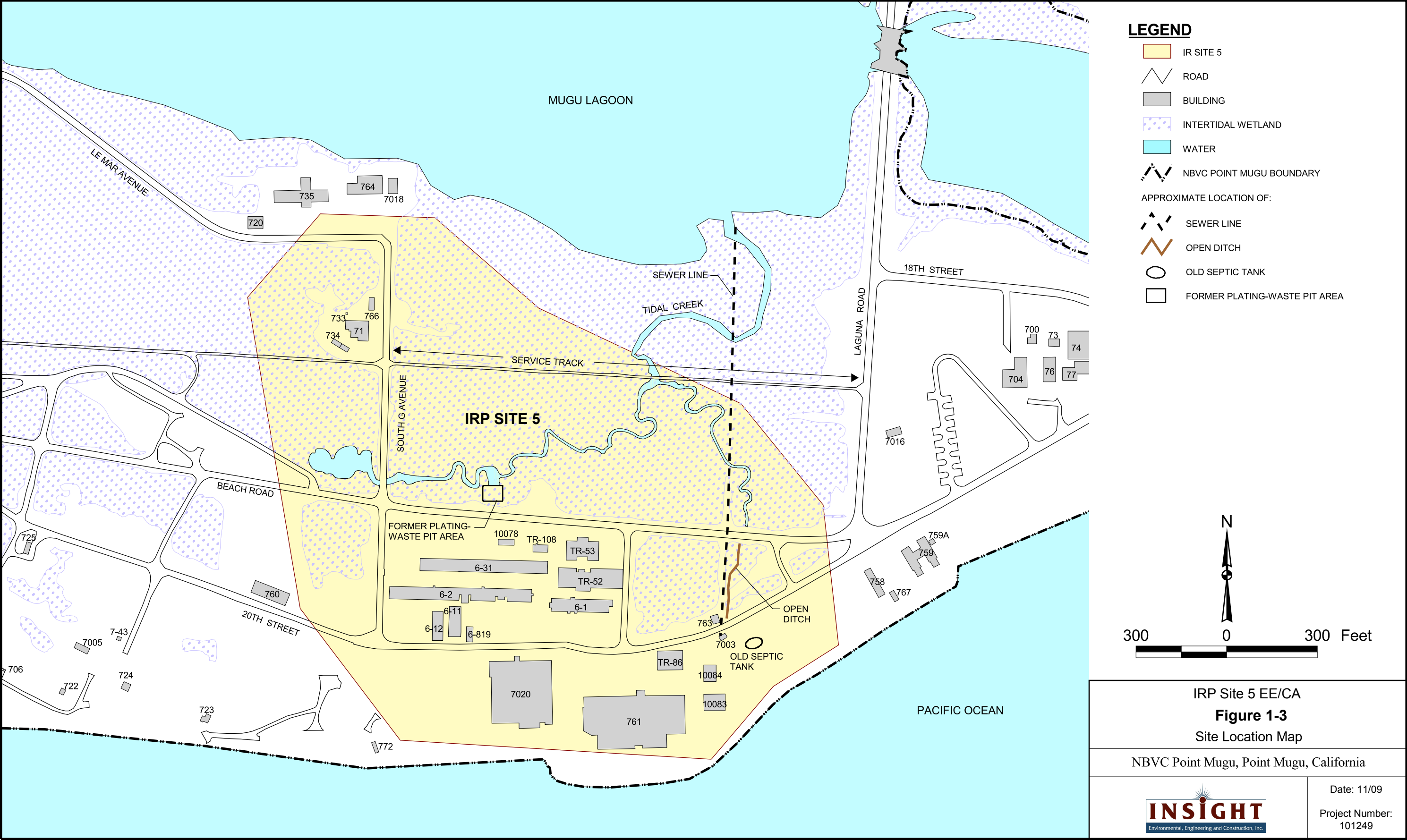
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2. SITE CHARACTERIZATION

The IRP Site 5 wetland sediment characterization presented herein is based mainly on the *Final Focused Feasibility Study Report* for Wetlands Sediment, IRP Site 5 (Bechtel Environmental, Inc. [BEI] 2008).

2.1 SITE BACKGROUND INFORMATION

This subsection provides facility and site descriptions and site history.

2.1.1 Facility Description

NBVC Point Mugu covers approximately 4,500 acres and supports 897 buildings, including 568 housing units. Many of the buildings were constructed on dredged material and other fill.

The Navy established temporary operations at Point Mugu in 1943 and has conducted operations there since 1944. In 1946, the Naval Air Missile Test Center was commissioned and, in 1949, the U.S. Naval Air Station was commissioned. Congress appropriated funding for a permanent Navy site at Point Mugu in 1947. The Pacific Missile Test Range was established in 1957 and was renamed "Pacific Missile Test Center" in the mid-1970s. In 1993, the names were revised again; the Pacific Missile Test Center became Naval Air Warfare Center Weapons Division, and the U.S. Naval Air Station became Naval Air Weapons Station (NAWS) Point Mugu. In 1998, NAWS Point Mugu was renamed "Naval Air Station (NAS) Point Mugu." As part of regionalization of Ventura County's naval bases, Naval Construction Battalion Center Point Hueneme and NAS Point Mugu were consolidated administratively under NBVC on 01 October 2000. The aviation mission and base operating support were consolidated under the NBVC command (TtEMI 2000). On 16 October 2006, NAS Point Mugu was renamed NBVC Point Mugu.

NBVC Point Mugu is a major center for testing and evaluating naval weapons systems and also provides range, technical, and base support for fleet users and other Department of Defense (DoD) agencies. NBVC Point Mugu currently maintains a fleet of over 50 aircraft, many of which are uniquely configured to support the assigned Test and Evaluation mission for airborne weapons and electronic warfare systems. Aircraft are also used for mobile range instrumentation, range surveillance and clearance, target launch and recovery, and logistics support. NBVC Point Mugu maintains the Navy's largest and most varied inventory of airborne targets. The base also provides target support for the Mobile Sea Range operation around the world. Support for other test ranges that require sophisticated threat-simulation support is also provided upon request (TtEMI 2000).

2.1.2 Site Description

IRP Site 5 is located just west of Laguna Road on a sand spit separating Mugu Lagoon and the Pacific Ocean (Figure 1-3). The site is on the southern side of the western arm of Mugu Lagoon.

IRP Site 5 consists of two distinct areas separated by Beach Road. The portion of IRP Site 5 south of Beach Road is used by base office personnel and contains four office trailers and one storage building. There are no plans at this time to change the use of the existing trailers and building or construct new buildings. The ground surface south of Beach Road consists of pavement interspersed with nonnative grassland habitat.

Most of the site north of Beach Road consists of salt marsh, tidal creek channels, and intertidal mudflats. This area of the site is currently used as a wildlife refuge and is anticipated to be used as a wildlife refuge in the future. Buildings have not been and will not be constructed on the wetland portion of the site. The former plating-waste pits were located north of Beach Road in this area. A

tidal creek originating at Mugu Lagoon cuts through the northern half of the site. An east-west power-line service track transects the northern half of IRP Site 5, obstructing surface water flow except where the tidal creek passes under the track through a pair of culverts.

2.1.3 Site History

Between 1947 and 1978, wastes associated with laboratory and shop operations were disposed at IRP Site 5. Documented discharge locations included a slough, located just north of Beach Road across from Building 6-31, and former plating-waste pits. Table 2-1 shows the probable origins of wastes, waste types, estimated amounts, discharge/disposal locations (when documented), and periods of disposal.

Table 2-1: Waste Generation and Handling Summary

| Building | Origin of Waste | Waste Type | Estimated Amount | Discharge/Disposal Location ^a | Operational Period |
|---------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 6-20*, 71 | Chemical laboratories | Organic solvents, rocket fuels, and miscellaneous laboratory chemicals | 10–50 gallons | Septic tank | 1947–1950 |
| | | | 50–500 gallons | Slough east of Building 71 on the east side of South G Avenue and north of the service track | 1949–1970 |
| 6-59* | Plating shop | Plating rinsate (reportedly contained high concentrations of cyanide and various metals, including chromium, copper, zinc, and tin) | 21,000,000 to 95,000,000 gallons | Slough just north of Beach Road, across from Building 6-31 (slough discharged into Mugu Lagoon) or plating-waste pits | 1948–1965 |
| | | Chromic acid, chrome etch, and carbon remover | 1,000 gallons | | |
| | Plating shop/surface treatment | Carbon tetrachloride and trichloroethylene | 1,000–10,000 gallons | | |
| 6-85* | Sandblasting shop | Sand and paint chips | 500–2,000 cubic feet | IRP Site 5 (exact location has not been identified) | 1948–1967 |
| 6-31, 6-32*, 6-33*, 6-58* | Machine, heat treatment, and engineering shops | Carbon tetrachloride, waste oil, and cutting oil | 1,000–5,000 gallons | Slough or plating-waste pits | 1950–1965 |
| 6-15* | Photo shop | Photograph fixer and developer containing silver, potassium bromide, and phenols | 30,000–60,000 gallons | Drain that led to septic tank in southeastern portion of IRP Site 5 south of 20th Street (septic tank discharged into open ditch in triangular area east of South F Avenue; ditch ultimately discharged into Mugu Lagoon) | 1947–1954 |
| 311 (IRP Site 6) | Sandblasting at technical support shop | Glass beads and paint chips | 10–500 cubic feet | IRP Site 5 (exact location has not been identified) | 1965–1978 |

Notes:

* building no longer exists

IRP Installation Restoration Program

In addition, an 8-inch sewer effluent line running north-south through the eastern portion of IRP Site 5 was discovered during a 1991 site visit by PRC Environmental Management, Inc. The effluent material was historically discharged to Mugu Lagoon; the origin of the line has not been identified with certainty (PRC and JMM 1993b).

2.2 SITE CHARACTERISTICS

This subsection provides an overview of the climate, topography, geology, hydrogeology, and surface water hydrology of IRP Site 5. Discussions on groundwater quality and uses and ecological characterization are also presented.

2.2.1 Climate

Climate in the NBVC Point Mugu area is moderately humid with mild, moist winters and warm, dry summers. Because the base is located adjacent to the Pacific Ocean, its climate is moderated by the effects of shore breezes. The mean annual low and high temperatures are 51.0 degrees Fahrenheit (°F) and 70.2 °F, respectively, with the highest temperatures occurring in August and the lowest occurring in February (Western Regional Climate Center 2001). The mean monthly precipitation ranges from 0.02 inch in June to 3.36 inches in February, with a mean annual precipitation of 14.82 inches (Western Regional Climate Center 2001). Approximately 95 percent of the annual precipitation occurs from November through April.

Wind speeds and directions near NBVC Point Mugu show seasonal variations. From March through September, westerly to northwesterly onshore winds are dominant from mid-morning through early evening. The onshore summer winds are typically 4 to 10 knots but can be significantly stronger in March, April, and May. From October through February, moderate, northeasterly, offshore winds of 4 to 10 knots are typical during the night and morning. These change in the afternoon to somewhat stronger, westerly, onshore winds (BEI 2008).

2.2.2 Topography

NBVC Point Mugu is located in the Ventura Basin, in the southern portion of the Oxnard Plain. The Oxnard Plain is generally flat, with a slight increase in elevation inland to the north. The Santa Monica and Santa Ynez Mountains bound the Ventura Basin to the east and north. As such, the topography of NBVC Point Mugu is generally flat, with mountains to the northeast where Laguna Peak is located. Elevations of NBVC Point Mugu range from sea level to about 11 feet above mean sea level. The elevation rises to about 26 feet above mean sea level at one isolated area in the south-central portion of the base, where sand dunes are present.

IRP Site 5 is near the southern shore of Mugu Lagoon, west of Laguna Road. The southern half of the site is paved and developed, while the northern half is a mixture of nontidal marsh areas; tidally influenced high-, mid-, and low-marsh areas; creek channels; and intertidal mudflats. The northern half is transected by an east-west powerline service track that obstructs surface water flow except where the main tidal creek passes under the track through a pair of culverts. IRP Site 5 is generally flat; developed areas are built on fill material over marsh (BEI 2008).

2.2.3 Geology

Lithological descriptions from logs of boreholes advanced during the Phase I remedial investigation (RI) and other previous investigations were used to assess subsurface conditions at the site. Borehole logs are presented in Appendix W of the Phase I RI Technical Memorandum (TtEMI 2000) and Appendix X of the Site Inspection (SI) Report (Fugro-McClelland 1991). Interpretations of the lithology differed on the borehole logs due to different sampling methods and use of different field

personnel during each investigation phase. These interpretations were assessed and combined; where conflicting descriptions occurred, preference was given to more recent descriptions. Lithologic descriptions from nearby boreholes were also included in the assessment to create a laterally consistent interpretation (Figures 2-1 and 2-2).

Soil boreholes from the SI and Phase I RI were advanced to maximum depths of 15 feet below ground surface (bgs). Due to the shallow completion of most boreholes, detailed lithology is available only for the shallow portion of the semiperched aquifer. The lithology observed at IRP Site 5 consists mainly of lowland fill, tidal flat deposits, and a sand unit.

2.2.3.1 DEEPER LITHOLOGY

Deeper lithology was interpreted from borehole log CM-1 from United States Geological Survey (USGS). Borehole CM-1 was located in the southern portion of IRP Site 5 (Figure 2-3). The borehole log indicates the semiperched aquifer extends to approximately 150 feet bgs; the “clay cap” aquitard is present from approximately 150 to 175 feet bgs; the Oxnard aquifer is present from approximately 175 to 235 feet bgs; and a lower aquitard is present from approximately 235 to 310 feet bgs, where the top of the Mugu aquifer is encountered. In addition, basalt was encountered at 590 feet bgs.

2.2.4 Hydrogeology

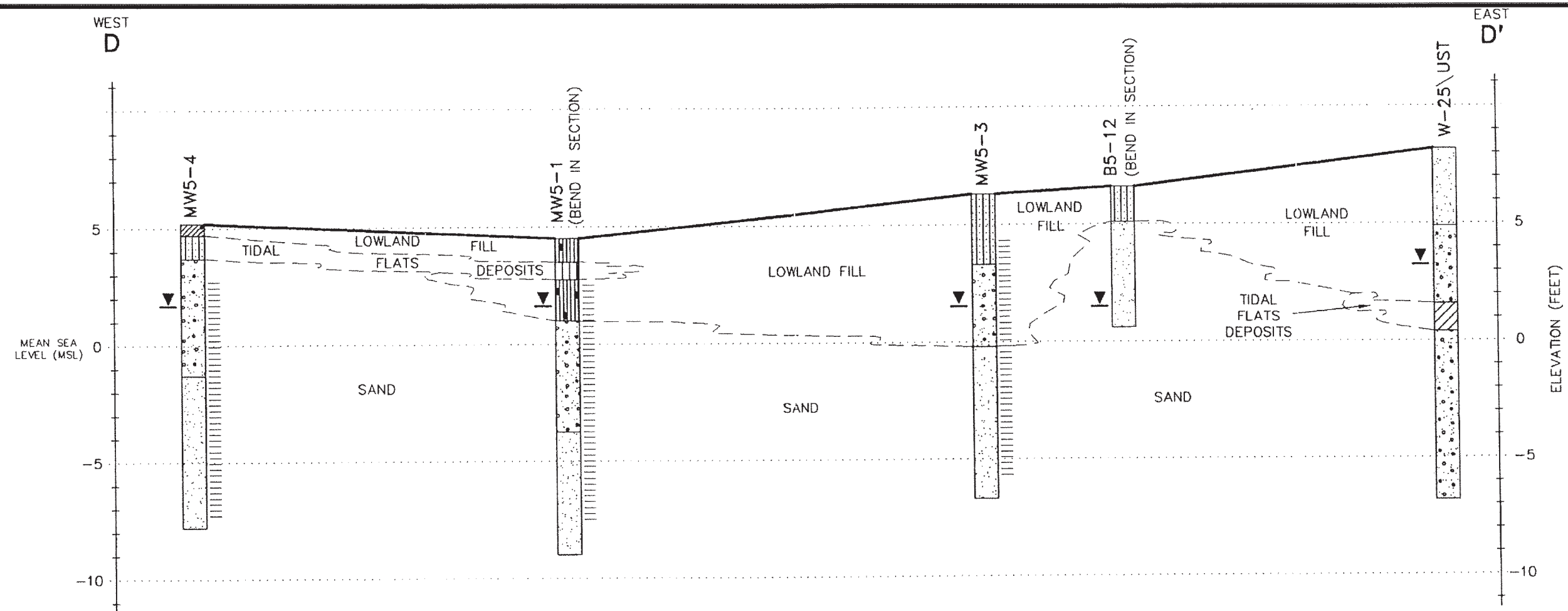
IRP Site 5 monitoring wells are screened at the top of the semiperched aquifer. The semiperched aquifer is unconfined and extends to approximately 150 feet bgs near IRP Site 5. It is separated from the underlying Oxnard aquifer by the clay cap aquitard. Based on lithologic logs of the USGS well boreholes, the clay cap aquitard is a silt-and clay layer as much as 20 feet thick. However, the aquitard appears to be approximately 20 to 40 feet thick at cone-penetrometer testing locations. The Oxnard aquifer is a confined aquifer approximately 200 feet thick and consists of Holocene fine- to coarse-grained sand and gravel. The Oxnard aquifer is considered the principal aquifer beneath the Oxnard Plain, although it is actively becoming degraded by seawater intrusion (TtEMI 2000).

Depth to groundwater in the uppermost water-bearing zone varies from approximately 0 to 7 feet bgs, depending on location, seasonal variations, and tidal fluctuations. Most of the groundwater table is present within the sand, but portions of the groundwater extend into the lowland fill and tidal flat deposits.

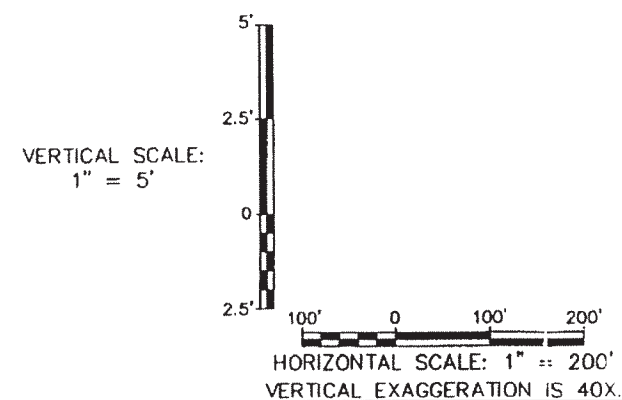
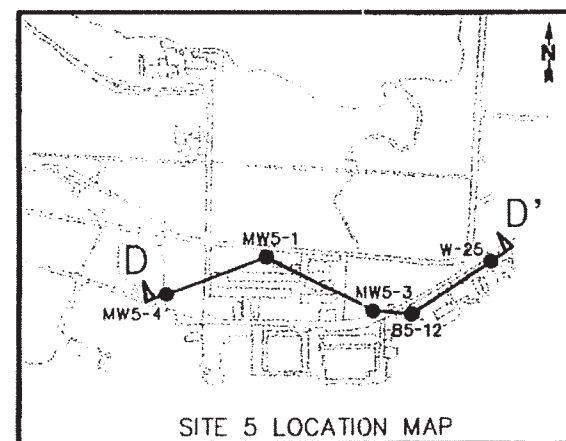
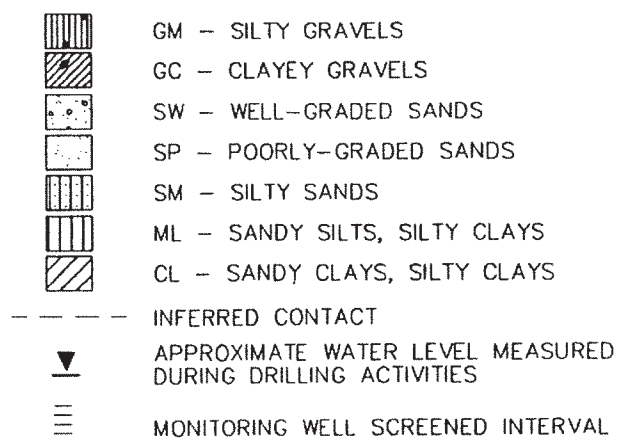
2.2.4.1 GROUNDWATER FLOW AND HYDRAULIC CONDUCTIVITY

Average groundwater elevations measured at nine wells across the site from the ocean to the lagoon were used to evaluate the groundwater surface at IRP Site 5 (Figure 2-3). Groundwater-level measurements were collected over a 71-hour period from 15 to 17 February 2002. Average groundwater elevations were corrected for tidal influence using the Serfes method (Serfes 1991).

Beneath IRP Site 5, groundwater in the semiperched aquifer flows toward Mugu Lagoon. A groundwater divide was previously interpreted in the southern half of IRP Site 5, roughly parallel to the Pacific Ocean shoreline and approximately 500 feet inland (TtEMI 2000). That interpretation was based on the assumption that the Pacific Ocean shoreline forms a constant head boundary with a groundwater elevation of mean sea level. Current data indicate that the divide, if present, is closer to the ocean than previously interpreted.



LEGEND



IRP Site 5 EE/CA Figure 2-1

Geologic Cross Section D-D'

NBVC Point Mugu, Point Mugu, California

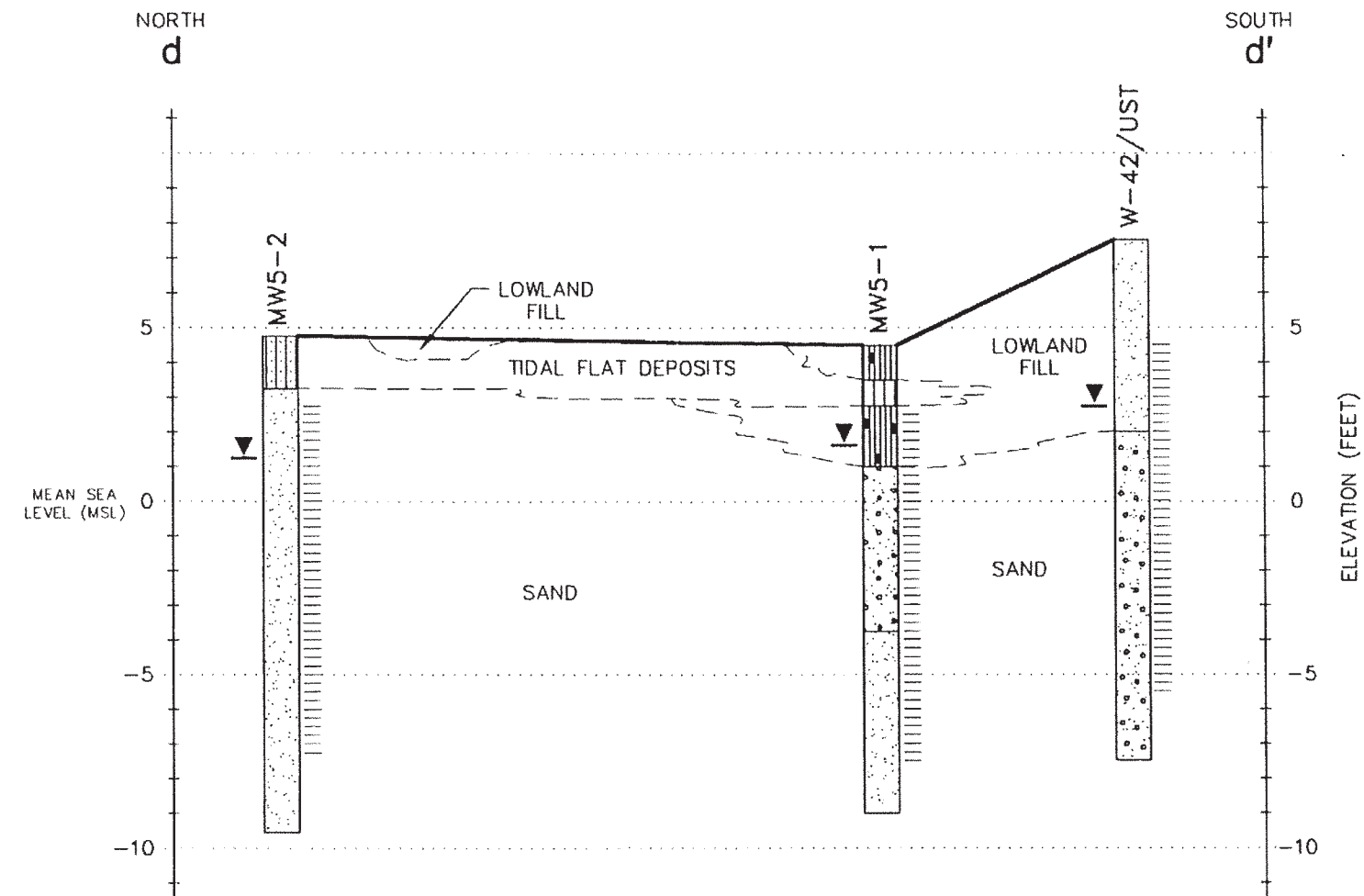


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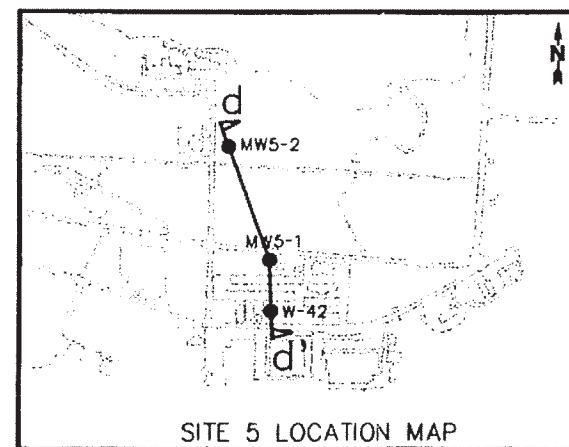
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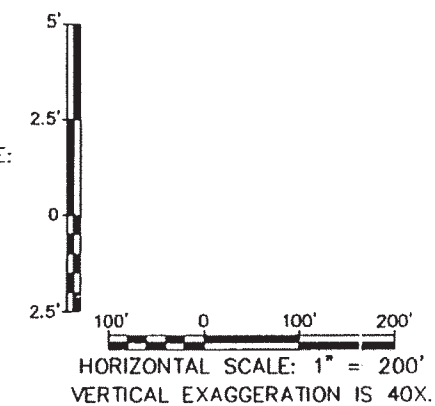


LEGEND

- GM - SILTY GRAVELS
- SW - WELL-GRADED SANDS
- SP - POORLY-GRADED SANDS
- SM - SILTY SANDS
- ML - SANDY SILTS, SILTY CLAYS
- INFERRED CONTACT
- ▼ APPROXIMATE WATER LEVEL MEASURED DURING DRILLING ACTIVITIES
- ||||| MONITORING WELL SCREENED INTERVAL



VERTICAL SCALE:
1" = 5'



IRP Site 5 EE/CA
Figure 2-2
Geologic Cross Section d-d'

NBVC Point Mugu, Point Mugu, California

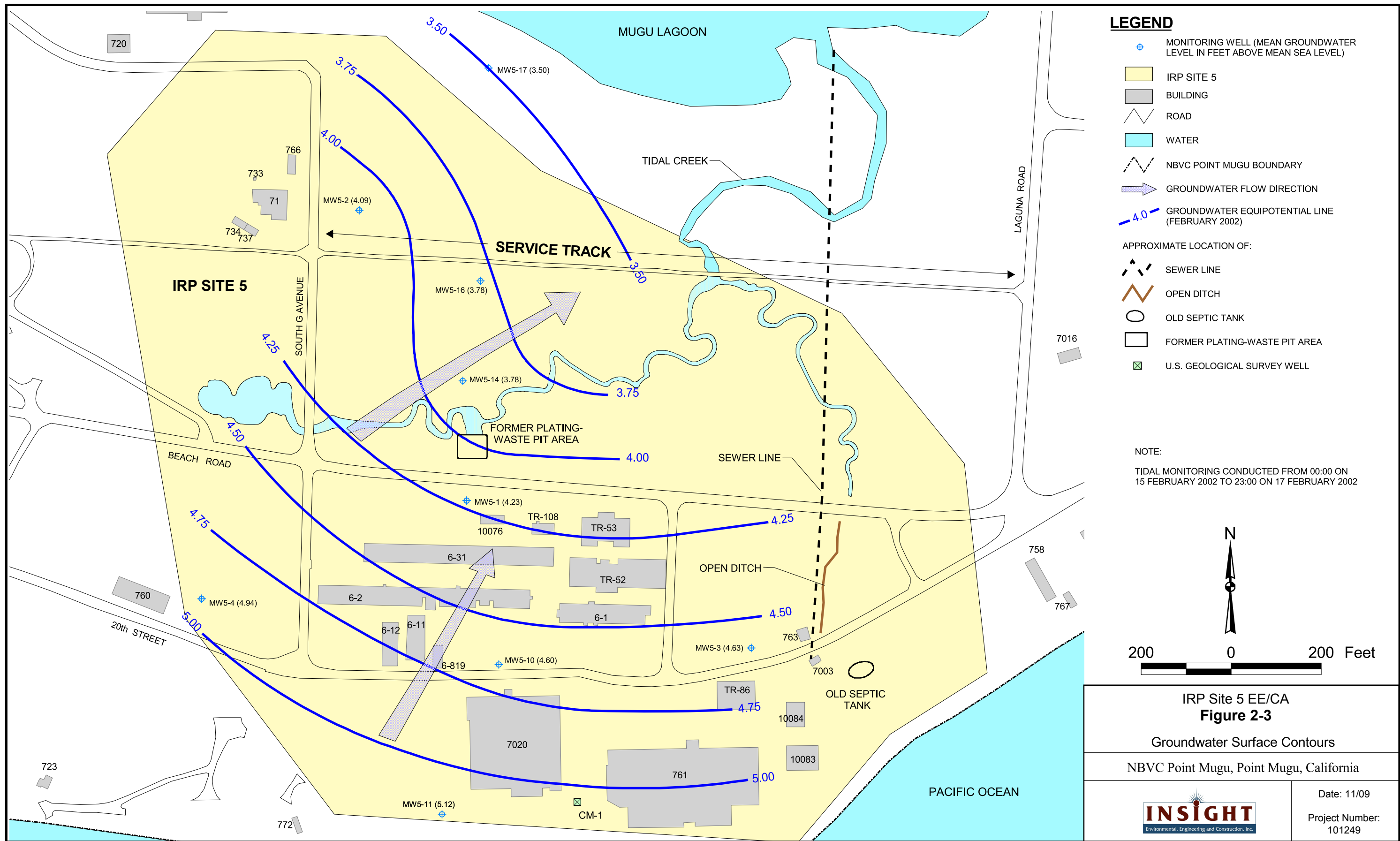
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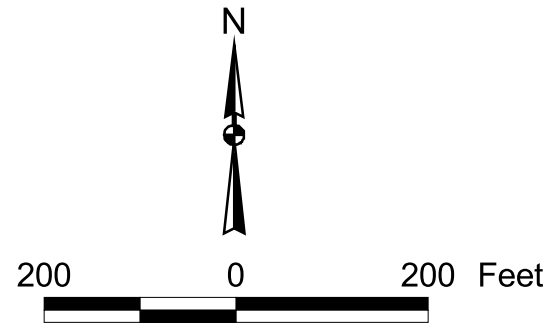
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LEGEND

- MONITORING WELL (MEAN GROUNDWATER LEVEL IN FEET ABOVE MEAN SEA LEVEL)
- IRP SITE 5
- BUILDING
- ROAD
- WATER
- NBVC POINT MUGU BOUNDARY
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER EQUIPOTENTIAL LINE (FEBRUARY 2002)
- APPROXIMATE LOCATION OF:
 - SEWER LINE
 - OPEN DITCH
 - OLD SEPTIC TANK
 - FORMER PLATING-WASTE PIT AREA
 - U.S. GEOLOGICAL SURVEY WELL

NOTE:
TIDAL MONITORING CONDUCTED FROM 00:00 ON
15 FEBRUARY 2002 TO 23:00 ON 17 FEBRUARY 2002



| | |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| IRP Site 5 EE/CA Figure 2-3 | |
| Groundwater Surface Contours | |
| NBVC Point Mugu, Point Mugu, California | |
|  Environmental, Engineering and Construction, Inc. | Date: 11/09 Project Number: 101249 |

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During the Phase I RI, hydraulic conductivities for the semiperched aquifer were calculated from rising-head and falling-head slug tests conducted at MW5-1 through MW5-4. In addition, effective porosity values were calculated from changes in water levels resulting from rain infiltration. These values were then combined with hydraulic gradients to calculate groundwater flow velocities. Appendix I of the Phase I RI Technical Memorandum (TtEMI 2000) describes slug testing procedures and the method for estimating hydraulic conductivity in further detail.

An average hydraulic conductivity at IRP Site 5 was calculated at 117 feet per day based on the rising-head slug test, and at 113 feet per day based on the falling-head slug test. These values are consistent with those expected for sand and silty sand (Freeze and Cherry 1979). The average effective porosity was 0.13; this figure is below the range of values typically observed for silt and sand and may be erroneous. The average hydraulic gradient is approximately 0.0014 in a generally northeast direction. The calculated groundwater flow velocity is approximately 1.2 feet per day.

2.2.4.2 TIDAL INFLUENCE

The area of tidal influence at NBVC Point Mugu extends along Mugu Lagoon, the Pacific Ocean, and the surface water bodies and rivers that are in contact with or near the ocean. Fluctuations in groundwater and surface water levels are greatest near the inlet from the lagoon to the ocean. Groundwater levels fluctuate to a greater extent near surface water bodies. Fluctuations in groundwater levels generally decrease with distance from the ocean and surface water bodies (TtEMI 2002b).

Hydrographs generated from tidal monitoring data indicate that groundwater is tidally influenced at several locations at IRP Site 5 (BEI 2005). Patterns of diurnal fluctuations indicative of tidal influence were most evident in wells MW5-11 (closest to the Pacific Ocean) and MW5-17 (closest to Mugu Lagoon). The pattern was also evident to a lesser extent in wells MW5-14 and MW5-16, located in the marsh area north of Beach Road, and in well MW5-1 located just south of Beach Road.

2.2.5 Groundwater Quality and Use

In accordance with the Water Quality Control Plan for Los Angeles Region (RWQCB 1994), the beneficial uses of the groundwater for the unconfined and perched aquifers in the Oxnard Plain include municipal and domestic supply, industrial process supply, and agricultural supply. Groundwater at NBVC Point Mugu exhibits a sodium-chloride-type chemistry characteristic of seawater intrusion (Hem 1992). The average total dissolved solids (TDS) concentration at IRP Site 5 is 8,980 milligrams per liter as measured during the Phase I RI (TtEMI 2000), and the semiperched aquifer is not being used as a source of drinking water.

IRP Site 5 has been determined not to be a significant source of groundwater TDS levels because mass-balance considerations rule out point-source contamination as a major contributor to the high TDS concentrations reported across the site (McBean et al. 1995). Although wastes produced at the site included photograph-developing chemicals (such as silver and potassium bromide), dominant ions found in groundwater (such as sodium and chloride) were not major constituents of the waste stream. Also, potassium and bromide concentrations in groundwater at IRP Site 5 are not significantly different from those in groundwater elsewhere at NBVC Point Mugu, further indicating that IRP Site 5 has not impacted major ion chemistry (and, therefore, TDS concentrations) in the underlying groundwater (TtEMI 2000).

2.2.6 Surface Water Hydrology

The beneficial uses can be divided into existing and potential beneficial uses. The existing beneficial uses of surface waters in Mugu Lagoon are navigation, non-contact water recreation, commercial and sports fishing (access limited), marine habitat, estuarine habitat, wildlife habitat with pinned haulout areas, support of areas of special biological significance, support of habitats for the survival of rare species as established under state or federal law (including Light-Footed Clapper Rail), migration of aquatic organisms, spawning, reproduction and early development of fish, shellfish harvesting, and wetland habitat. Potential beneficial uses include contact recreation (RWQCB 1994).

Aside from the Pacific Ocean, Mugu Lagoon is the most significant surface water body at NBVC Point Mugu. The lagoon hydrology is a function of freshwater inputs to the lagoon, tidal influence and flushing, and physical modifications to surface water flow. Mugu Lagoon is relatively shallow (generally less than 10 feet deep at high tide). Circulation patterns within the lagoon are characterized by slow rates of mixing and flushing in the extreme western portion of the lagoon and moderate to fast rates of mixing and flushing in the eastern and central sections of the lagoon. The rate of flushing is determined by tidal influence and the quantity of fresh water that enters the lagoon from Calleguas Creek, Revolon Slough, and the drainage ditches. Additional information is provided in the Integrated Natural Resource Management Plan (INRMP) (TtEMI 2002a).

IRP Site 5 is near the southern shore of Mugu Lagoon, west of Laguna Road. The southern half of the site is paved and developed, while the northern half is a mixture of nontidal marsh areas; tidally influenced high-, mid-, and low-marsh areas; creek channels; and intertidal mudflats. The northern half is transected by an east-west service track that obstructs surface water flow except where the main tidal creek passes under the track through a pair of culverts.

IRP Site 5 lies within four drainage areas, as described in the Storm Water Pollution Prevention Plan (PRC and JMM 1993a). The extreme northwestern portion of the site lies within drainage area 8 and drains by surface flow and tidal inundation through marsh areas to Mugu Lagoon. A southwestern portion of the site lies within drainage area 9, where surface water runoff collects in many sandy swale depressions not directly connected to any surface water body. The extreme southern end of the site lies within drainage area 2 at the beach/ocean interface. The remainder of the site, including the former plating-waste pits, lies within drainage area 10 and consists of tidal marshes to the north and developed areas to the south. Stormwater runoff from developed areas is directed to outfalls discharging into the marsh areas and eventually into Mugu Lagoon.

Tidal inundation at IRP Site 5 begins in the marsh areas adjacent to the main tidal creek that runs from Mugu Lagoon, through the service track culverts, and into the upper reaches of the tidal marsh. The tidal marsh on the north side of IRP Site 5 would be inundated in response to flood waters flowing in from this tidal creek. The east-west service track obstructs surface flow and is typically exposed at most tide levels, except for very high spring tides when water flows over portions of the track. Another surface flow barrier is the 8-inch sewer line that runs from the developed area at the south end of IRP Site 5, through the marsh areas and main tidal creek, and toward the lagoon. The sewer line lies on and follows the topography of the ground surface, except when going under roads or the service track. It restricts lateral movement of water in the main tidal creek and surrounding marsh, thus creating an area of sediment deposits. The southern portion of the site and the paved roads to the east (Laguna Road), south (Beach Road), and west (South G Avenue) have been built up topographically (filled) and are not subject to tidal inundation.

Aerial photographs taken at approximate low and high tide show that water is present in the sinuous marsh creeks during both periods. Around low tide, extensive mudflats are exposed at the north end of the site adjacent to Mugu Lagoon. At approximate high tide, a significant portion of the marsh

north of the service track is inundated and appears to pond along the north side of the service track culverts. During approximate high tide, the marsh creeks south of the service track are filled with water to Beach Road and under and west of South G Avenue (TtEMI 2000).

2.2.7 Ecological Characterization

NBVC Point Mugu supports a large estuarine ecosystem at Mugu Lagoon. This ecosystem has several different habitat types and supports many different plant and animal species, including several federal or California threatened and endangered species (Table 2-2). As described in the Ecological Risk Addendum (ERA) (TtEMI 2005), this section provides a brief description of the overall estuarine ecosystem and more detailed descriptions of the habitat categories, including associated flora and fauna and special-status species. More detailed descriptions of the specific habitat types, associated species, and special-status species are provided in the INRMP (TtEMI 2002a).

Table 2-2: Threatened and Endangered Species Occurring at Mugu Lagoon

| Common Name | Scientific Name | Status | Salt Marsh | Mudflat | Tidal Creek |
|----------------------------|--------------------------------------------|--------|------------|---------|-------------|
| Plants | | | | | |
| Salt marsh bird's-beak | <i>Cordylanthus maritimus maritimus</i> | FE, SE | X | | |
| Birds | | | | | |
| American peregrine falcon | <i>Falco peregrinus anatum</i> | SE | X | | |
| Belding's savannah sparrow | <i>Passerculus sandwichensis beldingi</i> | SE | X | X | X |
| California brown pelican | <i>Pelecanus occidentalis californicus</i> | FE, SE | | | X |
| California least tern | <i>Sterna antillarum browni</i> | FE, SE | X | X | X |
| Least Bell's vireo | <i>Vireo bellii pusillus</i> | FE, SE | X | | |
| Light-footed clapper rail | <i>Rallus longirostris levipes</i> | FE, SE | X | | X |
| Western snowy plover | <i>Charadrius alexandrinus nivosus</i> | FT | | X | |

Notes:

- X indicates species habitat
- FE federal endangered species
- FT federal threatened species
- SE state of California endangered species

The estuarine ecosystem includes open water, wetlands, and transitional upland habitats. Wetlands play a valuable role in the environment, both ecologically and physically. There are about 2,500 acres of jurisdictional wetlands on NBVC Point Mugu, making up 56 percent of its total area (approximately 4,490 acres). NBVC Point Mugu contains a variety of relatively undisturbed wetlands, ranging from salt marsh estuary and freshwater marshes to creeks. Major wetland areas on the base include Mugu Lagoon and Calleguas Creek.

Calleguas Creek provides wetland habitat, which is foraged by a variety of wildlife, including several federal- and state-listed species of birds. Mugu Lagoon is a salt marsh estuary at the mouth of Calleguas Creek. Freshwater marshes have developed in upland transition areas, where tidal influence is insufficient for salt marsh development. Ponded water in dune swales forms small wetlands in an otherwise arid environment. These small wetlands are usually dominated by the spiny rush (*Juncus acutus* ssp. *leopoldii*), an emergent aquatic plant that provides essential nesting habitat for the light-footed clapper rail (*Rallus longirostris levipes*). Several drainage ditches on the base support freshwater wetlands. The extensive marsh complex of Mugu Lagoon is one of the largest such areas remaining in this coastal strand environment.

Habitats at NBVC Point Mugu associated with Mugu Lagoon provide food, nesting, sheltering, breeding, and nursery habitat for numerous species of benthic invertebrates, fish, birds, and mammals. These habitat types are composed of intertidal salt marsh, mudflats, salt pannes, and tidal creeks. Other habitats found on NBVC Point Mugu include nontidal salt marsh, brackish and freshwater marsh, beaches and dunes, drainage ditches, transition, mixed transition disturbed, and developed areas.

The upland area of IRP Site 5 located south of Beach Road consists of pavement interspersed with nonnative grassland habitat. The northern half of IRP Site 5, north of Beach Road, is currently used as a wildlife refuge and primarily consists of salt marsh, tidal creek channels, and intertidal mudflats. Descriptions of these habitats are provided below. The more specific habitat types are described in detail in the INRMP (TtEMI 2002a).

2.2.7.1 SALT MARSH HABITAT

The main characterizing feature of salt marsh habitat is the presence of wetland vegetation, followed by the presence of a large variety of animal species. The salt marsh habitat category is inclusive of one main habitat type, intertidal salt marsh, and two smaller habitat types, nontidal salt marsh and brackish marsh. The intertidal salt marsh, which supports the majority of animal populations, is present at IRP Site 5 and is discussed below. The intertidal salt marsh habitat is described in detail in the INRMP (TtEMI 2002a).

Vegetation in the salt marsh changes gradually with elevation, with almost every species exhibiting its peak occurrence at a different elevation belt. Vegetation of this habitat type forms a continuum, rather than a set of zones. However, the presence of shrub-like succulents, pickleweed (*Salicornia* spp.), and the grass-like vegetation saltgrass (*Distichlis spicata*) at the uppermost elevations, and the taller jaumea (*Jaumea carnosa*) and sea-blite (*Sueda californica*, *S. esterosa*) at the lowest elevation helps to designate higher and lower marsh habitats.

Characteristic plants of the higher marsh are the perennial glasswort (*Salicornia subterminalis*), shoregrass (*Monanthochloe littoralis*), alkali heath (*Frankenia salina*), sea lavender (*Limonium carolinianum*), and salt bush (*Atriplex watsonii*). The salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *maritimus*) occurs in the higher marsh, more dominantly, in areas of reduced saltwater tidal flow but increased freshwater. Intermediate elevations of the salt marsh are wetted more frequently by the tides, and a higher tolerance for inundation is required of both the flora and fauna. The dominant plant is the perennial pickleweed (*Salicornia virginica*), which exhibits the broadest range in elevation of all the salt marsh species.

The salt marsh provides habitat for a wide variety of animals, which includes a diverse assemblage of migratory bird species (such as shorebirds), as well as the resident Belding's savannah sparrow (*Passerculus sandwichensis beldingi*). Large shorebirds and waders forage and rest in the marsh, while smaller shorebirds use the marsh as a nocturnal roosting site. Insects and benthic invertebrates

are also abundant in the intertidal salt marsh. Small mammals use the drier areas of salt marsh at Mugu Lagoon. Snakes are not common, and their rarity in part explains the abundance of rodents such as ground squirrels (*Spermophilus beecheyi*) and rabbits (*Lepus californicus* and *Sylvillagus audubonii sactidiegi*) that populate the upper marsh. The Pacific diamond-back rattlesnake (*Crotalus atrox*) inhabits the upper fringe of intertidal salt marsh habitat. The structure of this habitat type supports a complex food web. The animals of the midmarsh elevations are abundant and rich, which can be attributed to dependable moisture, and in part to the availability of food.

California horn snails (*Cerithidea californica*), lined shore crabs (*Pachygrapsus crassipes*), and yellow shore crabs (*Hemigrapsus oregonensis*) are abundant in the lower marsh. They feed on the algal mats and detritus and are eaten by the larger marsh birds. At Mugu Lagoon, light-footed clapper rails forage in the lower intertidal salt marsh habitat (as well as the intertidal tidal creeks), but nesting habitat is provided by spiny rush, which is located at the upper marsh/lower marsh fringe.

2.2.7.2 MUDFLAT AND SANDFLAT HABITATS

The mudflat habitat category includes exposed areas with fine (mud) or coarse (sand) grains and salt pannes (areas devoid of vegetation within the high intertidal salt marsh). These habitats are important foraging areas for shorebirds and can be haul-out sites for harbor seals (*Phoca vitulina richardsi*). The mudflat habitat is present at IRP Site 5 and is discussed below. Salt pannes are not present at IRP Site 5. Characteristics of both habitat types are described in detail in the INRMP (TtEMI 2002a).

The conspicuous species of the mudflat and sandflat are the shorebirds that feed and rest there during low tide. Harbor seals use the central basin shoreline as pupping and haul-out grounds. Mugu Lagoon serves as critical foraging and roosting habitat for shorebird populations on their spring and fall migrations and for overwintering. Mugu Lagoon provides habitat for up to 66,000 shorebirds during the spring and more than 10,000 at times in the fall and winter. The mudflat habitat is of critical concern for its unique and high productivity of benthic invertebrates and fisheries, which serve as critical food supplies for shorebird populations and wader populations, respectively.

Many of the prey animals are distributed from the subtidal channels to the lower limit of the salt marsh. Four invertebrate species that are characteristic of exposed flats are the California horn snail, the yellow shore crab, the fiddler crab (*Uca pugnax*), and the lined shore crab. A brief discussion of benthic communities is presented in the following section (2.2.7.3). It is known that California horn snails can be extremely abundant (hundreds to thousands per square meter) and that both California horn snails and crabs are important foods for the light-footed clapper rail (Jorgensen 1975).

2.2.7.3 TIDAL CREEK HABITAT

The tidal creek habitat category includes tidal channels, tidal creeks, estuarine channels within Mugu Lagoon, and the network of tidally influenced drainage ditches around the base. None of the drainage ditches are present at IR Site 5 and they are not discussed further. Characteristics of both habitat types are described in detail in the INRMP (TtEMI 2002a).

The characterizing features of the tidal creek habitat are the influence of tides and the general submergence of these areas during most low tides (however, these areas may be exposed during the lowest tides every month). The tidal creek habitat is important for a wide variety of organisms, including macroalgae, phytoplankton, invertebrates, fish, and birds.

The obvious plants of intertidal and subtidal areas are the macroalgae. Vascular plants, such as eelgrass (*Zostera marina*), are absent. However, large populations of benthic green macroalgae (*Enteromorpha spp.*) and sea lettuce (*Ulva spp.*) develop on the channel bottoms and later float to the water surface in some localized areas.

Historically, Mugu Lagoon's benthic community was dominated by bivalve mollusks, particularly the purple-hinged clam (*Sanquinolaria nuttalli*), littleneck clam (*Protothaca staminea*), false mya (*Cryptomya californica*), California jackknife clam (*Tagelus californianus*), and bent-nose clam (*Macoma nasuta*). Polychaete worms, gastropod mollusks, and decapod crustaceans were also numerically important. A very important food resource and common benthic invertebrate of the eastern arm of Mugu Lagoon is the bay ghost shrimp (*Callinassa californiensis*).

Estuaries are often considered to be essential spawning and nursery grounds for many fish species, and Mugu Lagoon is known to have nurseries for halibut and also may support nurseries for the gray smoothhound shark (*Mustelus californicus*).

Channels and tidal creeks at Mugu Lagoon are important foraging and resting areas for a variety of bird life, such as the great blue heron (*Ardea herodias*), which preys on fish in the channel. Shorebirds forage primarily for invertebrates in the sand and mud sediments and in the water column; diving birds prey on fish; wading birds use both fish and invertebrates for food, while others, such as dabbling ducks and plovers, feed on vegetation and surface insects. The California least tern (*Sterno antillarum browni*), the California brown pelican (*Pelecanus occidentalis californicus*), the light-footed clapper rail, and the Belding's savannah sparrow forage in the channels. Other birds that feed on fish in the channels are the belted kingfisher (*Megaceryle alcyon*), osprey (*Pandion haliaetus*), and double-crested cormorant (*Phalacrocorax auritus*).

Harbor seals are also common in the waters of the lagoon, and haul out on surrounding mudflats.

2.3 HISTORY OF PREVIOUS INVESTIGATIONS

Between 1985 and the present, several investigations and removal actions have been conducted at IRP Site 5. These are briefly summarized in Table 2-3.

Table 2-3: Summary of Previous Investigations

| Dates | Description | Reference |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1984 | Approximately 200 gallons of diesel fuel spilled onto the ground during removal of a buried tank from the parking area east of Building 6-1. Approximately 120 gallons of the spilled fuel was recovered and the contaminated soil was removed and treated. | SCS and Landau Associates 1985 |
| 1985 | The IAS identified IRP Site 5 for further investigation. Information in the IAS consisted of Old Area 6 Shops historical information summaries and lists of types and quantities of wastes disposed at the site. Environmental samples were not collected as a part of the IAS. | SCS and Landau Associates 1985 |
| 1989–1991 | The SI reported metals, VOCs, SVOCs, and DDTs, in IRP Site 5 soil. The contaminants were expected to have an impact on the Mugu Lagoon environment and possibly on human health. The SI Report therefore recommended further study. | Fugro-McClelland 1991 |
| 1993–1994 | <p>The Phase I RI reported SVOCs and metals in soil samples; pesticides, PCBs, and metals in sediment samples; metals in surface water samples; and metals in groundwater samples.</p> <p>An ERA was performed, which included a biological characterization and a scoping assessment. The ERA identified antimony, chromium, copper, lead, nickel, silver, zinc, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, gamma-chlordane, and Aroclor 1260 as ecological COPCs for IRP Site 5. The ERA concluded that upland areas of IRP Site 5 do not provide extensive wildlife habitat, and ecological exposure to soil contaminants in the upland area is minimal. Although elevated levels of heavy metals were detected at the former plating-waste pits and were identified as COPCs, at the time of the Phase I RI, exposure was mitigated by coverings placed on the pits.</p> <p>Based on the results of toxicity tests and benthic community analyses, the Phase I RI concluded that IRP Site 5 sediment poses little or no risk to the marine bottom community. The Phase I RI recommended an FS for ecological COPCs in soil and sediment at IRP Site 5 as well as a groundwater assessment to evaluate potential</p> | TtEMI 2000 |

| | | |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| | attenuation of ecological COPCs. | |
| June 1994 | During an emergency removal action, approximately 117 cubic yards of soil was removed from above the water table at the former plating-waste pits. Following excavation, a cover of galvanized hardware cloth over chicken wire was installed over the former plating-waste pits to prevent wildlife from contacting any residual contaminants. Confirmation sampling indicated concentrations of copper, nickel, and silver were reduced below their respective TTLC values, while concentrations of cadmium and chromium were still above their TTLC values at the bottom of the excavation. | PRC 1995 |
| 1996 | Laboratory studies to assess whether EK remediation could be an effective treatment option were conducted by ERDC. | DoD 2000 |
| January to February 1997 | Characterization work done to support the EK remediation technology demonstration included collection of surface and subsurface soil samples at 40 points, groundwater samples at 4 points, and surface water samples at 3 points. Additionally, two 60-foot cores were recovered to provide information about subsurface geology and lithology. | LB&M 1997 |
| March and October 1998 | An EK technology demonstration was conducted at Test Cell 1. | TN&A 2003 |
| 1998–1999 | A basewide RI groundwater study was conducted in response to recommendations in the Phase I RI. The groundwater study was designed to evaluate the potential for COPCs to migrate from groundwater to surface water at Mugu Lagoon and the on-base drainage ditches. As part of the investigation, groundwater samples were collected from well MW5-4 at IRP Site 5. Copper was reported in groundwater above the screening value (2.4 µg/L) at well MW5-4 in two out of four sampling events. IRP Site 5 was not identified as a contributor to human-health or ecological risks in surface water. | TtEMI 2002b |
| January to June 1999, November 2000 to June 2003 | In January 1999, ERDC assumed the lead for the EK pilot study and restarted operations. The EK system was temporarily stopped in mid-June 1999 and restarted in November 2000. The system was reconfigured in the spring of 2001 and operated until mid-June 2003. | TN&A 2004 |
| 2001 | A screening-level ERA was conducted to evaluate risk from concentrations of COPCs to representative bird and mammalian receptors. Data collected during the Phase I RI was used. No significant ecological risk to vertebrate receptors in the upland areas was identified. The ERA concluded that the song sparrow may be at potential risk from maximum concentrations of chromium, lead, and HMW PAH; the light-footed clapper rail may be at potential risk from maximum concentrations of arsenic, chromium, lead, mercury, selenium, HMW PAH, and total DDTs; the surf scoter may be at potential risk from maximum concentrations of lead, manganese, mercury, selenium, HMW PAHs, and total DDTs; and the great blue heron may be at potential risk from maximum concentrations of lead, mercury, HMW PAHs, and total DDTs. | TtEMI 2001 |
| 2001 | A Phase II RI was conducted to fill data gaps around a former drain line and septic tank at IRP Site 5. Soil samples and groundwater samples from microwells were collected from a total of six locations. The locations were near the former septic tanks and at damaged areas of the drain. One year of quarterly groundwater monitoring was conducted. Analytical data did not indicate the presence of VOC or metals contamination. | Battelle 2002 |
| 2002 | A Tier II ERA was conducted to further evaluate the potential ecological risk posed to birds in the tidal salt marsh and tidal creek habitats by metals, DDTs, and Aroclors in the sediment. Sediment and tissue samples were collected from five new locations and from reference areas. The ERA indicated potential unacceptable risk to individual clapper rails from cadmium and chromium in sediment and potential unacceptable risk to the song sparrow from chromium in sediment. An FS was recommended to address these risks. | TtEMI 2005 |
| August–October 2003 | The EK pilot study test site was decommissioned. Decommissioning included dismantling and demolishing the EK pilot study equipment, excavating and disposing of concentrated metals-contaminated soil, and restoring the area to coastal wetlands. A total of 1,080 cubic yards of soil was excavated from within the plastic barrier wall at the test site. The final depth of the excavation ranged from 6 feet to 14 feet bgs. Confirmation sampling indicated the average final concentrations were below the project decommissioning goals. The excavation was backfilled with clean fill and the plastic barrier wall was removed to 2 feet bgs. | TN&A 2004 |
| 2002, 2004 | CTR criteria. Fate and transport modeling simulations indicated that: 1) copper could migrate as far as Mugu Lagoon at concentrations exceeding the CTR criterion, but | BEI 2005 |

| | | |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| | this was not predicted to occur within the next 700 years; and 2) chromium, nickel, and PCE concentrations exceeding the CTR criteria would not be expected to migrate as far as Mugu Lagoon. The HHRA indicated no unacceptable risk to human health from groundwater COPCs. | |
| 2008 | The Focused FS Report was developed and evaluated remedial action alternatives to address ecological risks to birds (e.g., song sparrow and light-footed clapper rail) and mammals (e.g., deer mouse) from chemicals of concern in wetland sediment at IRP Site 5. | BEI 2008 |

Notes:

| | |
|------|---------------------------------------------|
| bgs | below ground surface |
| COPC | chemical of potential concern |
| CTR | California Toxics Rule |
| DDD | dichlorodiphenyldichloroethane |
| DDE | dichlorodiphenyldichloroethene |
| DDT | dichlorodiphenyltrichloroethane |
| EK | electrokinetic |
| ERA | ecological risk assessment |
| ERDC | Engineering Research and Development Center |
| FS | feasibility study |
| HHRA | human-health risk assessment |
| HMW | high molecular weight |
| IAS | initial assessment study |
| IRP | Installation Restoration Program |
| µg/L | micrograms per liter |
| PAH | polynuclear aromatic hydrocarbon |
| PCB | polychlorinated biphenyl |
| PCE | tetrachloroethene |
| RI | remedial investigation |
| RME | reasonable maximum exposure |
| SI | site inspection |
| SVOC | semivolatile organic compound |
| TTL | total threshold limit concentration |
| VOC | volatile organic compound |

The maximum reported concentrations of cadmium, chromium, copper, lead, nickel, and silver remaining in IRP Site 5 sediment after the 1994 removal action and the EK pilot study decommissioning are presented in Table 2-4. The chemicals of concern (COCs) identified for the Focused FS Report (BEI 2008) are cadmium, chromium, copper, lead, nickel, and silver. Concentrations of COCs remaining in IRP Site 5 sediment are presented on Figure 2-4. The area with the highest remaining concentrations of COCs is located near the former plating-waste pits, within 100 feet of the EK decommissioning excavation footprint (Figure 2-4).

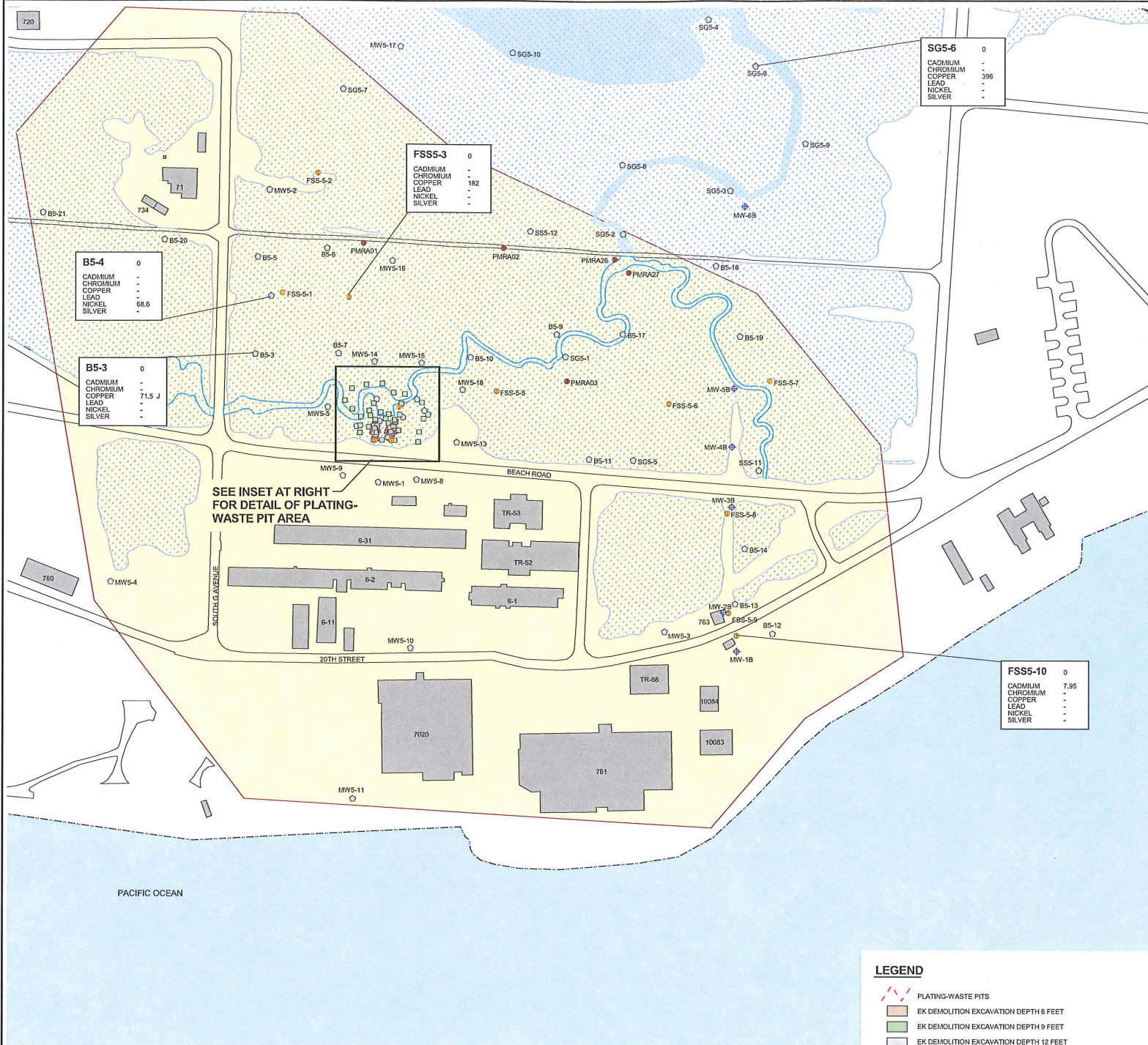
Table 2-4: Maximum Reported Concentrations of COCs Remaining After 2003 EK Demolition

| Metals | EK Project Decommissioning Goals | Maximum Remaining Concentrations |
|----------|----------------------------------|----------------------------------|
| cadmium | 15 | 157 (LSS5-35) |
| chromium | 109 | 25,100 (LSS5-36*) |
| copper | 245 | 2,080 (FSS5-4*) |
| lead | 138 | 238 (FSS5-4*) |
| nickel | 425 | 1,000 (FSS5-4*) |
| silver | 11 | 159 (FSS5-4*) |

Notes:

* indicates that the sample was collected at the surface (0 feet bgs)

| | |
|-----|----------------------|
| bgs | below ground surface |
| COC | chemical of concern |
| EK | electrokinetic |

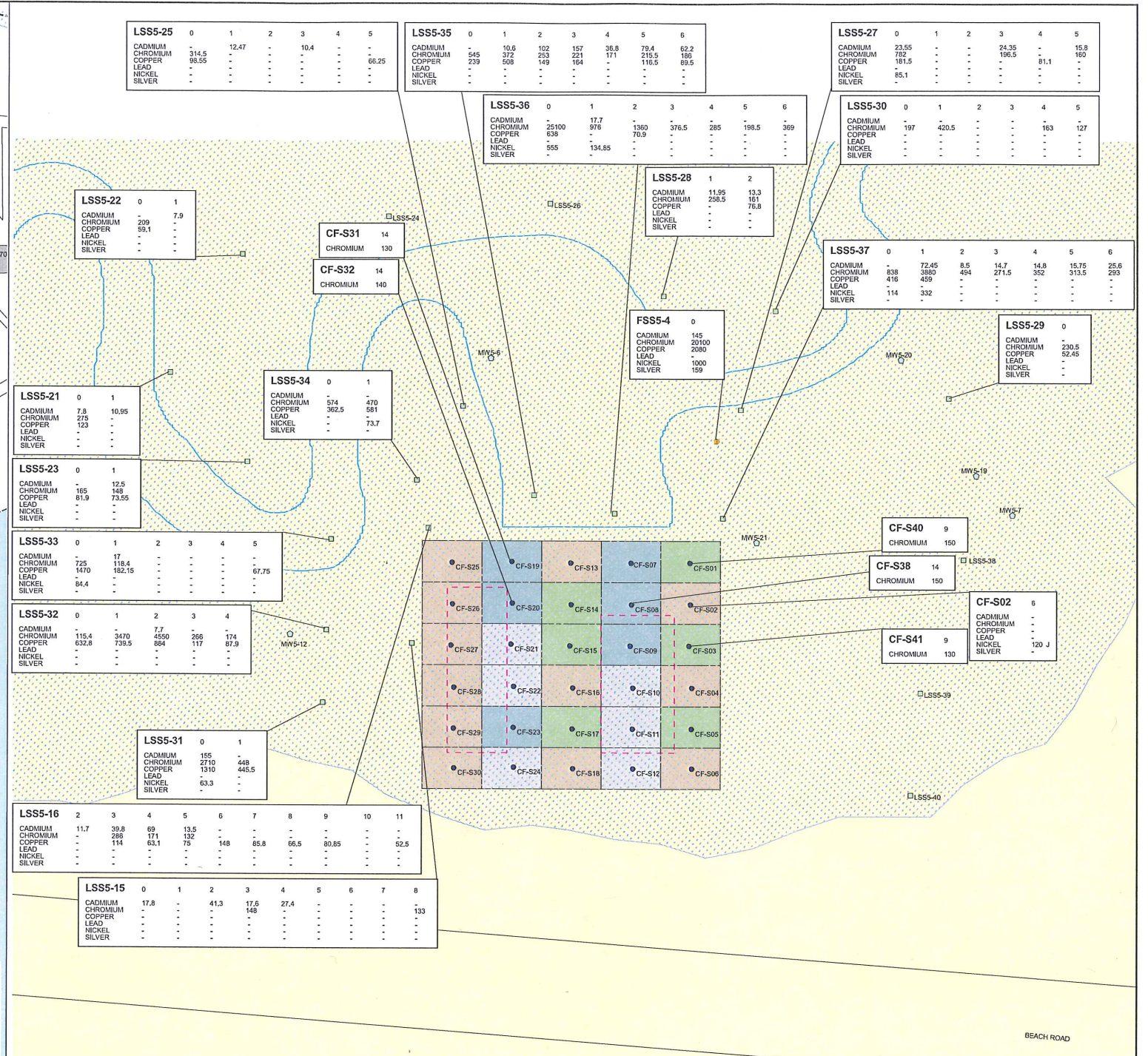
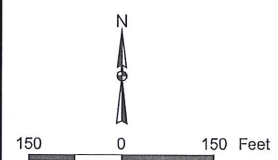
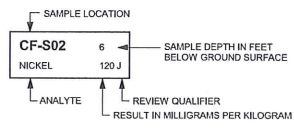


SEE INSET AT RIGHT
FOR DETAIL OF PLATING-
WASTE PIT AREA

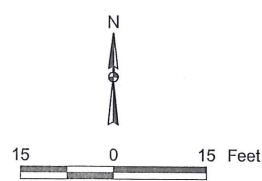
LEGEND

- PLATING-WASTE PITS
- EK DEMOLITION EXCAVATION DEPTH 6 FEET
- EK DEMOLITION EXCAVATION DEPTH 9 FEET
- EK DEMOLITION EXCAVATION DEPTH 12 FEET
- EK DEMOLITION EXCAVATION DEPTH 14 FEET
- SITE INSPECTION (FUGRO-McCLELLAND 1991)
NOTE: AN "F" WAS ADDED TO SAMPLE DESIGNATIONS TO AVOID
CONFUSION WITH OTHER SAMPLES HAVING SIMILAR
DESIGNATIONS
- EMERGENCY REMOVAL ACTION (PRC 1995)
- INITIAL DATA CHARACTERIZATION EVENT (LS&M ASSOCIATES 1997)
NOTE: AN "L" WAS ADDED TO SAMPLE DESIGNATIONS TO AVOID
CONFUSION WITH OTHER SAMPLES HAVING SIMILAR
DESIGNATIONS
- PHASE 1 REMEDIAL INVESTIGATION TECH MEMO (TIEM 2000)
- PHASE 2 REMEDIAL INVESTIGATION REPORT (BATTTELLE 2002)
- ECOLOGICAL RISK ASSESSMENT ADDENDUM (TIEM 2005)
- DEMOLITION ACTIVITIES REPORT (TNS&A 2004)
- INTERTIDAL WETLANDS
- CREEK
- ROAD
- BASE BOUNDARY
- BUILDING
- WATER
- IR SITE 5

NOTES:
SEDIMENT MANAGEMENT OBJECTIVE FOR CADMIUM IS 7.56 mg/kg
SEDIMENT MANAGEMENT OBJECTIVE FOR CHROMIUM IS 115 mg/kg
SEDIMENT MANAGEMENT OBJECTIVE FOR COPPER IS 51.3 mg/kg
SEDIMENT MANAGEMENT OBJECTIVE FOR LEAD IS 260 mg/kg
SEDIMENT MANAGEMENT OBJECTIVE FOR NICKEL IS 62.98 mg/kg
SEDIMENT MANAGEMENT OBJECTIVE FOR SILVER IS 51.3 mg/kg
J - ESTIMATED VALUE
mg/kg - MILLIGRAMS PER KILOGRAM



INSET OF PLATING-WASTE PIT AREA



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2-20

2.4 CONTAMINANT FATE AND TRANSPORT

This subsection discusses the physical, chemical, and biological processes that control whether the COCs will remain in the sediment or transfer to other media. The COCs (cadmium, chromium, copper, lead, nickel, and silver) may occur as free ionic species in solution, precipitates or colloidal materials, or bound to sediment particles.

Cadmium occurs in the environment in the divalent oxidation state (Sadiq 1992). Aqueous cadmium may complex with carbonates, oxides, chlorides, sulfates, sulfides, humic acids, and other organic compounds (Sadiq 1992). In seawater, cadmium is primarily bound with chloride forms. Cadmium may settle to the sediment when complexed with sediment particles, metals oxides, and organic matter. Due to the levels of pH, organic matter, dissolved oxygen, and salinity in estuarine surface water, the mobility and bioavailability of cadmium is expected to be low (Moore and Ramamoorthy 1984). Most of the cadmium is expected to be in precipitates in the sediment; little is expected as a dissolved free ionic species. In the reducing conditions of the subsurface sediment, cadmium is expected to bind with sulfide and form cadmium sulfide precipitate of low solubility. Sediment disturbance may lead to remobilization and increased bioavailability of cadmium.

The cadmium distribution is not expected to be modified by physical processes such as diffusion, advection, and convection. This is due to the stable forms of cadmium present in the sediment. Tidal currents and wave action are not expected to affect the distribution of cadmium; however, bioturbation by burrowing organisms may cause cadmium concentrations to redistribute. Cadmium, which has no known beneficial biological role (Eisler 1985), will bioaccumulate in the estuarine system; evidence is available that biomagnification occurs in the food chain (Eisler 1985). Most cadmium in the sediment is not expected to be bioavailable; only a small amount of the total cadmium is likely to be in a dissolved, bioavailable form. However, benthic invertebrates were reported to accumulate significant cadmium directly from the sediment.

Chromium is expected to be present in the trivalent and hexavalent oxidation states in IRP Site 5 sediment (Martello et al. 2005). Dissolved chromium in surface water usually occurs as hexavalent chromium (Eisler 1986, 2000), which is a strong oxidizing agent. Although hexavalent chromium is stable in seawater (ATSDR 2000), it may be reduced by organic matter to trivalent chromium (ATSDR 2000). Trivalent chromium forms complexes resulting in relatively insoluble precipitates (oxides, hydroxides, and phosphates) that eventually settle to the sediment. Trivalent chromium also binds with organic ligands (any organic molecule serving as an electron donor) and sediment particles. Under aerobic oxidizing conditions such as in surface water or sediment, hexavalent chromium may be present (ATSDR 2000). Under anaerobic reducing conditions such as in subsurface sediment, only trivalent chromium is expected to be present due to hexavalent chromium reduction by sulfide and ferrous iron (ATSDR 2000).

Because the forms of chromium that occur in the sediment are stable, physical processes, such as diffusion, advection, and convection are not expected to modify the distribution of chromium at the site. Tidal currents and wave action are also not expected to affect the distribution of chromium; however, bioturbation by burrowing organisms may cause chromium concentrations to redistribute. Chromium, a trace essential nutrient in biological systems (Eisler 1985, NRC 1997), has a low bioaccumulation potential, and biomagnification does not occur in the food chain (Eisler 1985, ATSDR 2000). Most chromium in the sediment is not expected to be bioavailable; only a small amount of total chromium is likely to be in a dissolved, bioavailable form.

In seawater and marine sediment, the divalent state (cupric) is the predominant oxidation form of copper (Eisler 2000, Sadiq 1992). Copper hydroxide, copper carbonate, and cupric ion are major chemical forms in water. Copper will also form strong bonds with organic compounds and clay-sized

particles in saltwater (Sadiq 1992). Principle forms of copper in marine sediment are cupric ferrite in oxic conditions and copper sulfide in anoxic conditions (Sadiq 1992). Copper is an essential element for all forms of life, however, excess copper can be toxic. Aquatic life can accumulate copper directly from water or sediment.

Lead is mainly present in the environment in the divalent state since the other states are generally unstable (Sadiq 1992). Lead can form strong bonds with organic and inorganic carbonates, and oxides and hydroxides of iron and manganese. Lead can form a very stable mineral of lead sulfide (galena) under anoxic conditions. However, lead can be released again if the conditions reverse and sediment becomes more oxidized. Bioaccumulation and toxicity depend on the chemical form of lead present and are generally related to the solubility of the chemical form.

Nickel is most commonly present in surface water and sediment in the divalent oxidation state. Chemical forms of nickel include complexes with organic and inorganic compounds that are generally soluble (Eisler 2000). However, at pH of 8 to 9 many of the complexes are more insoluble (Moore and Ramamoorthy 1984). Nickel precipitates as nickel sulfide under anaerobic conditions (Eisler 2000). Nickel has been shown to bioconcentrate from surface waters, but biomagnification within the food chain has not been indicated (Eisler 2000). Nickel is considered one of the least toxic trace metals in aquatic systems, especially for ingestion exposures (Eisler 2000).

Silver is a nonessential element and considered one of the most toxic metals to aquatic organisms (Eisler 2000). Several oxidation states can be formed but the most common are elemental silver and monovalent silver. Silver binds strongly with sulfur in organic and inorganic complexes, and adsorbs to manganese and iron compounds and clay particles. In reducing conditions, silver compounds are reduced to insoluble metallic silver and silver sulfide. Under aerobic conditions, silver tends to form more soluble complexes with chlorine. Bioaccumulation is an important factor for benthic invertebrates, but biomagnification through the food chain is unlikely (Eisler 2000).

2.5 RISK ASSESSMENT ACTIVITIES

This subsection summarizes the risk assessment activities conducted for IRP Site 5. Human-health risk assessments and ERAs are presented.

2.5.1 Baseline Human-Health Risk Assessments

Two baseline human-health risk assessments have been conducted at IRP Site 5. The first was completed as part of the Phase I RI (TtEMI 2000) and considered soil, sediment, and surface water. The second was performed as part of the Phase II groundwater RI (BEI 2005) and evaluated risk to human health from groundwater at this site.

2.5.2 Ecological Risk Assessment Results

Several ERAs have been conducted for IRP Site 5. The first, completed as part of the Phase I RI, consisted of a biological characterization of the site and a scoping assessment (TtEMI 2000). A screening-level ERA was then conducted to evaluate risk from concentrations of COPCs to representative bird and mammalian receptors (TtEMI 2001). A Tier II ERA was performed that focused on evaluating the potential ecological risk from metals, dichlorodiphenyltrichloroethanes (DDTs), and Aroclors in the marsh sediment of IRP Site 5 (TtEMI 2005).

2.5.2.1 PHASE I RI

During the Phase I RI, an ERA for IRP Site 5 was performed that included a biological characterization of the site and a scoping assessment (TtEMI 2000). The biological characterization

identified habitats present at the site using data collected on the vegetation, mammals, fish, and benthic invertebrates. In addition, a scoping assessment was performed that addressed potential receptors, exposure pathways, and identification of COPCs.

Biological Characterization

Data were collected to validate food chain models and support the selection of receptors for the ERA. Data on community characteristics at IRP Site 5 were obtained by conducting vegetation, benthic infauna and epifauna, mammal, and fish surveys. A compilation of the plant and animal species identified during the surveys is provided in the Phase I RI (TtEMI 2000).

Scoping Assessment

The scoping assessment evaluated the habitats and receptors that occur at IRP Site 5, the occurrence of COPCs, and the potential for ecological exposure in the upland, tidal marsh, and tidal creek areas of the site.

Conclusions

The Phase I RI identified antimony, chromium, copper, lead, nickel, silver, zinc, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, gamma-chlordane, and Aroclor 1260 as COPCs for IRP Site 5. Based on an ERA, the Phase I RI recommended an FS for COPCs in soil and sediment at IRP Site 5 and a groundwater assessment to evaluate the attenuation of COPCs at IRP Site 5 (TtEMI 2000).

2.5.2.2 VERTEBRATE TECHNICAL MEMORANDUM

The Vertebrate Technical Memorandum presented a screening-level ERA conducted for IRP Site 5 to evaluate risk from concentrations of COPCs to representative bird and mammalian receptors (TtEMI 2001). The screening-level ERA used comparison of site chemistry with toxicity benchmarks and a food chain modeling approach to evaluate potential risk. During food chain modeling, site-specific doses were estimated and compared to toxicity reference values (TRVs) using a hazard quotient (HQ) approach. Two distinct areas at IRP Site 5 were evaluated: an upland habitat area characterized by pavement interspersed with nonnative grassland, and an area consisting of salt marsh and tidal creek habitats. Both soil (in the upland areas) and sediment (in the remaining areas) present complete exposure pathways for ecological receptors at IRP Site 5. The screening level ERA used data collected during the Phase I RI; no new data were collected.

Upland Habitat

In the upland areas of IRP Site 5, ecological risks were determined to be low, and exposure pathways will likely remain muted because of the presence of pavement (TtEMI 2001). HQs calculated using both the high and low TRVs in the food chain models indicate that the deer mouse may be at risk from maximum concentrations of cadmium, lead, manganese, and nickel (Table 2-5); however, the upland areas of IRP Site 5 provide only limited habitat and food sources. The maximum concentrations of cadmium and nickel are associated with the former plating-waste pits. Results of the screening-level ERA for IRP Site 5 upland habitat indicate that the site does not pose significant risk to ecological receptors.

Table 2-5: Hazard Quotients for Upland Habitat Species From the Screening-Level ERA

| COPC | HQ (Maximum Dose ^a /High TRV) | HQ (Maximum Dose ^a /Low TRV) |
|-------------------------------------|------------------------------------------------|-----------------------------------------------|
| Deer Mouse^b | | |
| Cadmium | 12.03 | 529 |
| Copper | 0.04 | 9.38 |
| Lead | 0.01 | 1,723 |
| manganese | 0.09 | 1,065 |
| Nickel | 0.20 | 46.7 |
| American Kestrel^c | | |
| Cadmium | 0.05 | 10.4 |
| Lead | 0.05 | 19.3 |

Notes:

^a the maximum dose was calculated using an average ingestion rate, average body weight, an SUF of 1.0, site maximum soil concentrations, and tissue concentrations estimated using literature BAFs (Sample et al. 1996; U.S. EPA 1998, 1999a); HQ for chromium was not calculated because insufficient data were available to derive TRVs for chromium; chromium was qualitatively evaluated

^b a sediment ingestion rate of 0.000062 kg/day, a prey ingestion rate of 0.0025 kg/day, and a receptor body weight of 0.018 kg was used for the deer mouse

^c a sediment ingestion rate of 0.00010 kg/day, a prey ingestion rate of 0.014 kg/day, and a receptor body weight of 0.11 kg was used for the American kestrel

BAF bioaccumulation factor
 COPC chemical of potential concern
 ERA ecological risk assessment
 HQ hazard quotient
 kg kilogram
 kg/day kilograms per day
 SUF site-use factor
 TRV toxicity reference value

Salt Marsh and Tidal Creek Habitats

For the salt marsh and tidal creek habitats, the ERA concluded that the song sparrow was potentially at risk from maximum concentrations of chromium, lead, and high molecular weight (HMW) polynuclear aromatic hydrocarbon (PAH); the light-footed clapper rail was potentially at risk from maximum concentrations of arsenic, chromium, lead, mercury, selenium, HMW PAH, and total DDTs; the surf scoter was potentially at risk from maximum concentrations of lead, manganese, mercury, selenium, HMW PAH, and total DDTs; and the great blue heron was potentially at risk from maximum concentrations of lead, mercury, HMW PAH, and total DDTs (Table 2-6).

Table 2-6: Hazard Quotients for Salt Marsh and Tidal Creek Species From the Screening-Level ERA

| COPC | HQ (Maximum Dose ^a /High TRV) | HQ (Maximum Dose ^a /Low TRV) |
|---------------------------------|------------------------------------------------|-----------------------------------------------|
| Song Sparrow^b | | |
| Cadmium | 43.3 | 8,854 |
| Copper | 3.84 | 95.5 |
| Lead | 2.03 | 809 |
| Mercury | 0.83 | 3.81 |
| Nickel | 0.84 | 34.0 |
| Zinc | 0.17 | 1.70 |
| Total DDTs | No TRV | 1.61 |

| Light-Footed Clapper Rail^c | | |
|----------------------------------------------|--------|--------|
| arsenic | 1.47 | 5.88 |
| cadmium | 464 | 94,778 |
| copper | 3.45 | 85.6 |
| Lead | 13.9 | 5,540 |
| manganese | 0.31 | 3.07 |
| mercury | 2.55 | 11.8 |
| nickel | 9.09 | 368 |
| selenium | 1.87 | 7.57 |
| Zinc | 1.6 | 16.0 |
| Total DDTs | No TRV | 22.7 |
| Surf Scoter^d | | |
| arsenic | 0.61 | 2.44 |
| cadmium | 193 | 39,436 |
| copper | 1.43 | 33.5 |
| Lead | 5.78 | 2,303 |
| manganese | 0.13 | 1.28 |
| mercury | 1.06 | 4.89 |
| nickel | 3.78 | 153 |
| selenium | 0.78 | 3.15 |
| Zinc | 0.67 | 6.65 |
| Total DDTs | No TRV | 9.45 |
| Great Blue Heron^e | | |
| cadmium | 61.0 | 12,469 |
| copper | 0.46 | 11.5 |
| Lead | 1.85 | 736 |
| mercury | 0.34 | 1.57 |
| nickel | 1.20 | 48.7 |
| selenium | 0.25 | 1.00 |
| Zinc | 0.21 | 2.13 |
| Total DDTs | No TRV | 3.01 |

Notes:

^a the maximum dose was calculated using an average ingestion rate, average body weight, an SUF of 1.0, site maximum soil concentrations, and tissue concentrations estimated using literature BAFs (Sample et al.1996; U.S. EPA 1998, 1999a); HQ for chromium was not calculated because insufficient data were available to derive TRVs for chromium; chromium was qualitatively evaluated

^b a sediment ingestion rate of 0.00053 kg/day, a prey ingestion rate of 0.0061 kg/day, and a receptor body weight of 0.025 kg were used for the song sparrow

^c a sediment ingestion rate of 0.0013 kg/day, a prey ingestion rate of 0.037 kg/day, and a receptor body weight of 0.28 kg were used for the light-footed clapper rail

^d a sediment ingestion rate of 0.0021 kg/day, a prey ingestion rate of 0.067 kg/day, and a receptor body weight of 0.95 kg were used for the surf scoter

^e a sediment ingestion rate of 0.0042 kg/day, a prey ingestion rate of 0.061 kg/day, and a receptor body weight of 2.30 kg were used for the great blue heron

BAF bioaccumulation factor
 COPC chemical of potential concern
 DDT dichlorodiphenyltrichloroethane
 ERA ecological risk assessment
 HQ hazard quotient
 kg kilogram
 kg/day kilograms per day
 SUF site-use factor
 TRV toxicity reference value

Chemicals requiring further evaluation for each receptor are listed in Table 2-7. Further evaluation was recommended to address the ecological risk posed to birds from these COPCs in marsh sediment at IRP Site 5 (TtEMI 2001).

Table 2-7: Chemicals Identified for Further Evaluation by the Screening-Level ERA

| Vertebrate Receptor | Chemicals Identified for Further Evaluation |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Upland | |
| Deer mouse | None |
| American kestrel | None |
| Wetland | |
| Song sparrow | cadmium*, chromium, copper*, lead, mercury, nickel*, zinc*, HMW PAHs, total DDTs |
| Light-footed clapper rail | arsenic, cadmium*, chromium, copper*, lead, manganese, mercury, molybdenum, nickel*, selenium, silver, zinc*, HMW PAHs, total DDTs |
| Surf scoter | arsenic, cadmium*, copper*, lead, manganese, mercury, molybdenum, nickel*, selenium, zinc*, HMW PAHs, total DDTs |
| Great blue heron | cadmium*, copper*, lead, mercury, molybdenum, nickel*, selenium, zinc*, HMW PAHs, total DDTs |

Notes:

* maximum concentrations of these metals are associated with the former plating-waste pits at IRP Site 5, which make up a small area of the site; at the time the screening-level ERA was conducted, the former plating-waste pits were undergoing an EK pilot study; at the conclusion of the EK pilot study, the former plating-waste pits were excavated to 6 to 14 feet bgs

bgs below ground surface

DDT dichlorodiphenyltrichloroethane

EK electrokinetic

ERA ecological risk assessment

HMW high molecular weight

IRP Installation Restoration Program

PAH polynuclear aromatic hydrocarbon

2.5.2.3 ERA ADDENDUM

Based on results of the screening-level ERA presented in the Vertebrate Technical Memorandum (TtEMI 2001), a Tier II ERA was conducted to further evaluate the potential ecological risk posed to receptors exposed to sediments in the marsh areas of IRP Site 5. In 2002, sediment and tissue samples were collected from five new sampling locations and analyzed for metals, DDTs, and Aroclors (TtEMI 2005). Also during the 2002 sampling event, both the East and West Reference Areas, established with agency input during the Phase I RI (TtEMI 2000), were sampled and compared with IRP Site 5 data because the site is likely influenced from off-base sources to the north from the Oxnard drainage ditches and to the east from the Calleguas Creek watershed.

The ERA focused on risk to birds in the salt marsh and tidal creek habitats. Risk to plants and invertebrates, evaluated in earlier reports (TtEMI 2000), was evaluated further using the data collected during the 2002 sampling event. Mammalian receptors were not considered at risk based on the screening-level ERA and were not evaluated further.

Ingestion of contaminated prey and media is considered to be the predominant exposure pathway at IRP Site 5. For salt marsh and tidal creek habitats, complete exposure routes for plants, aquatic invertebrates, and vertebrates were considered to be direct or coincidental uptake or ingestion of contaminated sediment or tissue and direct exposure to chemicals leaching from sediment into surface water. Assessment endpoints included plants, invertebrates, and representative bird species.

COPCs were identified by screening the maximum concentrations reported in the 2002 sediment samples against toxicity-based benchmarks for plants, invertebrates, and vertebrates. Other

chemicals identified as COPCs for birds in the previous screening level ERA (TtEMI 2001) were also evaluated using food chain modeling.

Risk to Plants

Previous investigations had not indicated significant risk to plants at IRP Site 5 (TtEMI 2000). Using data collected during the 2002 sampling event, risk to plants was further evaluated by comparing reported concentrations of COPCs within the salt marsh habitat to toxicity benchmarks and evaluating bioaccumulation potential based on pickleweed tissue residue concentrations.

In the data collected during 2002, maximum concentrations of arsenic, molybdenum, nickel, selenium, silver, and zinc were similar to or slightly greater than the Oak Ridge National Laboratory (ORNL) plant benchmark. Chromium was the only chemical with a maximum concentration that was significantly greater than the ORNL plant benchmark. Metals do not appear to be bioaccumulating at a significant rate; all bioaccumulation factors were less than 1. Some DDTs and Aroclors may be accumulating in plant tissues at higher rates. Except for chromium and silver, concentrations of all the chemicals in the salt marsh habitat at IRP Site 5 were statistically less than concentrations in the reference areas.

Risk to Invertebrates

The screening-level ERA conducted during the Phase I RI (TtEMI 2000) did not identify significant risk to invertebrates at IRP Site 5. Data collected in 2002 to confirm these results identified arsenic, cadmium, chromium, copper, nickel, and silver as invertebrate COPCs because maximum concentrations of these metals exceeded ERL values.

All the metal COPCs, with the exception of silver, had maximum concentrations that were less than the effects-range median (ERM) value, the concentration above which adverse effects are considered likely to occur. The maximum concentration of silver slightly exceeded the ERM value in both the salt marsh and tidal creek habitats. Several DDT congeners were also identified as invertebrate COPCs at IRP Site 5. Total DDD, 4,4'-DDE, and total DDTs had maximum concentrations that exceeded the ERM value. Total Aroclors was also identified as an invertebrate COPC, but the maximum concentration was below the ERM value. Site concentrations of all DDT congeners in both habitats were similar to, and in some cases less than, those in the reference areas.

The results of toxicity tests conducted with amphipods and polychaetes for sediment collected from one location in the mudflat area of IRP Site 5 were not significantly different from laboratory controls and do not indicate adverse effects. The simultaneously extracted metals/acid volatile sulfide results indicate that the bioavailability of divalent metals at IRP Site 5, such as arsenic, cadmium, copper, and nickel, was low. In addition, metals are generally less available for uptake under neutral soil conditions like those at the IRP Site 5 salt marsh (TtEMI 2000).

Risk to Vertebrates

The screening-level ERA identified potential risk for the song sparrow, light-footed clapper rail, surf scoter, and great blue heron from COPCs in sediment at IRP Site 5 (TtEMI 2001). Risk to representative birds at IRP Site 5 was evaluated further through a food chain modeling approach using combined data that consisted of new sediment and tissue residue data collected in 2002 and pre-2002 sediment data. HQs calculated for these receptors are presented in Tables 2-8 through 2-11 (TtEMI 2005).

Table 2-8: Hazard Quotients for Song Sparrow from the ERA Addendum

| Salt | Marsh Habitat | | | |
|------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------|
| | HQ (Dose ^a /High TRV) Diet: 50% Crab and 50% Pickleweed | HQ (Dose ^a /Low TRV) Diet: 50% Crab and 50% Pickleweed | HQ (Dose ^a /High TRV) Diet: 100% Pickleweed | HQ (Dose ^a /Low TRV) Diet: 100% Pickleweed |
| COPC | | | | |
| Cadmium | 0.19 | 39.32 | 0.19 | 39.53 |
| Chromium | 4.68 | 23.39 | 4.67 | 23.34 |
| copper | 0.31 | 7.58 0.18 4.54 | | |
| lead | 0.12 | 49.07 | 0.12 | 47.45 |
| nickel | 0.067 | 2.72 | 0.068 | 2.75 |
| Selenium | 0.87 | 3.53 0.43 1.74 | | |
| total DDTs | 0.020 | 4.25 | — ^b | — |

Notes:

^a the dose was calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), an SUF of 1.0, and the lesser of the 95 percent UCL of the arithmetic mean or the maximum concentration for site tissue values and sediment values (the mean was used when the 95 percent UCL could not be calculated because of low detection frequency)

^b dash indicates no HQs exceeded 1.0

COPC chemical of potential concern
 DDT dichlorodiphenyltrichloroethane
 ERA ecological risk assessment
 HQ hazard quotient
 kg kilogram
 kg/day kilograms per day
 SUF site-use factor
 TRV toxicity reference value
 UCL upper confidence limit

Table 2-9: Hazard Quotients for Great Blue Heron from the ERA Addendum

| | Salt Marsh Habitat | | Tidal Creek Habitat | |
|------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| | HQ (Dose ^a /High TRV) Diet: 75% Mollusk and 25% Crab | HQ (Dose ^a /Low TRV) Diet: 75% Mollusk and 25% Crab | HQ (Dose ^a /High TRV) Diet: 75% Mollusk and 25% Crab | HQ (Dose ^a /Low TRV) Diet: 75% Mollusk and 25% Crab |
| COPC | | | | |
| cadmium | 0.014 | 2.87 | 0.0084 | 1.73 |
| Lead | 0.0056 | 2.24 | 0.0056 | 2.22 |
| total DDTs | 0.022 | 4.77 | 0.022 | 4.77 |

Notes:

* the dose was calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), an SUF of 1.0, and the lesser of the 95 percent UCL of the arithmetic mean or the maximum concentration for site tissue values and sediment values (the mean was used when the 95 percent UCL could not be calculated because of low detection frequency)

COPC chemical of potential concern
 DDT dichlorodiphenyltrichloroethane
 ERA ecological risk assessment
 HQ hazard quotient
 kg kilogram
 kg/day kilograms per day
 SUF site-use factor
 TRV toxicity reference value
 UCL upper confidence limit

Table 2-10: Hazard Quotients for Light-Footed Clapper Rail from the ERA Addendum

| COPC | Salt Marsh and Tidal Creek Habitats | | | |
|------------|------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------|
| | HQ (Maximum Dose*/High TRV) Diet: 100% Crab | HQ (Maximum Dose*/Low TRV) Diet: 100% Crab | HQ (Average Dose*/High TRV) Diet: 100% Crab | HQ (Average Dose*/Low TRV) Diet: 100% Crab |
| cadmium | 1.14 | 233.21 | 0.026 | 5.37 |
| chromium | 10.13 | 50.64 | 0.47 | 2.36 |
| copper | 0.24 | 5.99 0.13 3.21 | | |
| lead | 0.20 | 81.11 | 0.023 | 9.30 |
| nickel | 0.093 | 3.75 | 0.013 | 0.52 |
| selenium | 0.55 | 2.23 0.50 2.03 | | |
| total DDTs | 0.015 | 3.30 | 0.011 | 2.37 |

Note:

* the doses were calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), and a n SUF of 1.0; the maximum dose used the maximum site sediment and tissue concentrations; the average dose used the 95 percent UCL of the arithmetic mean or the mean for site sediment values if the 95 percent UCL could not be calculated due to low frequency of detection, and the 95 percent UCL or mean sites tissue if the 95 percent UCL was greater than the maximum

COPC chemical of potential concern
 DDT dichlorodiphenyltrichloroethane
 ERA ecological risk assessment
 HQ hazard quotient
 kg kilogram
 kg/day kilograms per day
 SUF site-use factor
 TRV toxicity reference value
 UCL upper confidence limit

Table 2-11: Hazard Quotients for Surf Scoter from the ERA Addendum

| COPC | Tidal Creek Habitat | |
|------------|----------------------------------------------------|---------------------------------------------------|
| | HQ (Dose*/High TRV) Diet: 100% Mollusk | HQ (Dose*/Low TRV) Diet: 100% Mollusk |
| Total DDTs | 0.0069 | 1.49 |

Notes:

* the dose was calculated using an average ingestion rate (sediment ingestion rate of 0.00045 kg/day and prey ingestion rate of 0.0052 kg/day), an average body weight (0.025 kg), an SUF of 1.0, and the lesser of the 95 percent UCL of the arithmetic mean or the maximum concentration for site tissue values and sediment values (the mean was used when the 95 percent UCL could not be calculated because of low detection frequency)

COPC chemical of potential concern
 DDT dichlorodiphenyltrichloroethane
 ERA ecological risk assessment
 HQ hazard quotient
 kg kilogram
 kg/day kilograms per day
 SUF site-use factor
 TRV toxicity reference value
 UCL upper confidence limit

Chromium presents a significant or immediate risk to the song sparrow (HQ high TRV>1) at doses based on the 95 percent upper confidence limit of the arithmetic mean. Cadmium and chromium present a significant or immediate risk to the light-footed clapper rail (HQ high TRV>1) at maximum doses; average doses based on a measure of central tendency, however, do not indicate a significant or immediate risk (HQ high TRV<1) to the light-footed clapper rail.

Song sparrows and light-footed clapper rails have relatively small foraging ranges, and individual birds located in areas with elevated cadmium or chromium concentrations may be at risk. The greatest cadmium and chromium concentrations were reported from the pre-2002 data and are located near the former plating-waste pits. Chromium concentrations are greater at IRP Site 5 than those in either the East or West Reference Areas. The maximum concentrations of cadmium from the salt marsh and salt marsh/tidal creek habitats at IRP Site 5 are greater than those at the reference areas, with the exception of the West Reference Area, for the tidal creek habitat.

Conclusions

The ERA Addendum concluded that COPCs in sediment at IRP Site 5 do not pose significant risk to populations of plants and that adverse effects to populations of invertebrates are unlikely (TtEMI 2005). Chromium concentrations at IRP Site 5 were statistically greater than concentrations at the reference areas and potentially pose significant or immediate risk to the song sparrow and light-footed clapper rail, a special-status species. Cadmium concentrations at IRP Site 5 were statistically greater than concentrations at the West Reference Area and may also pose significant or immediate risk to the light-footed clapper rail.

Based on the results of the ERA Addendum, an EE/CA is recommended to address risk from cadmium and chromium in sediment to the light-footed clapper rail, which is a special status species, and the risk from chromium in sediment to the song sparrow. However, during development of the Draft EE/CA Report, regulators requested that copper, lead, nickel, and silver be addressed in addition to cadmium and chromium and that removal goals and alternatives presented in the EE/CA be protective of small mammals in addition to birds. It was noted that the IRP Site 5 ecological risk assessments did not include data from some of the most contaminated areas because at the time the former plating-waste pits were covered with hardware cloth and a complete exposure pathway did not exist. The Navy will consult with California Department of Fish and Game regarding the removal action such that it minimizes disturbance to special status wild life. Considerations will include seasonal timing and other measures during the removal action activities, such as proximity of the wild life, time-of-day for operating equipment and other constraints.

2.6 SUMMARY OF CONDITIONS JUSTIFYING REMOVAL

Based on the results of the ERA Addendum (TtEMI 2005), the elevated chromium concentrations at IRP Site 5 pose significant or immediate risk to the song sparrow and light-footed clapper rail, a special-status species. In addition, the elevated cadmium concentrations at IRP Site 5 also pose significant or immediate risk to the light-footed clapper rail. In addition, during development of the Draft EE/CA Report, regulators requested that copper, lead, nickel, and silver be addressed in addition to cadmium and chromium and that removal goals and alternatives presented in the EE/CA be protective of small mammals in addition to birds. Therefore, given the potential of exposing on-site receptors to elevated COC concentrations, a response that either eliminates or minimizes the exposure is required for sediment at IRP Site 5.

3. IDENTIFICATION OF REMOVAL ACTION OBJECTIVES

This section identifies the removal action scope and objectives for the IRP Site 5 wetland sediment removal action. The removal action objectives are based on the CERCLA, the NCP, the ERA Addendum evaluation discussed in Section 2.6, and ARARs. These objectives are used to develop removal action alternatives presented in Section 4.

3.1 STATUTORY FRAMEWORK

This removal action is taken pursuant to CERCLA and the NCP under the delegated authority of the Office of the President of the U.S. by Executive Order 12580. This order provides the DON with authorization to conduct and finance removal actions. This removal action is non-time-critical because a 6-month planning period was available from the time a removal action was determined to be necessary before the initiation of removal actions. The requirements for this EE/CA and its mandated public comment period provide opportunity for public input to the cleanup process.

DTSC has to comply with the California Environmental Quality Act (California Public Resources Code, Section 21000, et seq.) and evaluate the impact of this project on the environment. DTSC will determine the type of compliance document after an evaluation of this project.

3.2 REMOVAL ACTION SCOPE

The scope of the removal action is to implement measures designed to protect against the threat to the environment caused by contamination in sediment. The removal action is consistent with Navy IRP Program cleanup objectives to provide permanent and cost-effective cleanup remedies for contaminated sediment, and to permanently and significantly reduce the toxicity, mobility, and volume of hazardous wastes, thereby reducing the risk to the environment. The removal action will be conducted at IRP Site 5 as shown in Figure 3-1.

3.3 REMOVAL ACTION OBJECTIVES

The removal action objective for the IRP Site 5 wetland sediment is as follows:

- Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment.

Also, because the wetland sediment at IRP Site 5 is adjacent to Mugu Lagoon and is connected to Mugu Lagoon by a tidal creek, the alternative should ensure that the wetland sediment at IRP Site 5 is not a source of non protective levels of chromium to Mugu Lagoon. Mugu Lagoon is designated as IRP Site 11 and has a remediation goal of 81 mg/kg for chromium. The removal action is an interim step, designed to remove/reduce imminent risks, until the acceptable levels have been defined and the results of this removal action can be compared to those levels. If sediment concentrations in portions or all of the removal action area do not meet the acceptable levels, additional response actions may be required.

3.4 REMOVAL ACTION SCHEDULE

Figure 3-2 presents the schedule for the removal action at the IRP Site 5 wetland sediment. Adherence to the schedule will depend on timely regulatory approval of the EE/CA and public acceptance of the removal action.

3.5 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The NCP states, “Removal actions...shall to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under Federal environmental or State environmental or facility siting laws” [40 CFR 300.415(j)]. The evaluation of ARARs for this EE/CA is presented in Appendix A.

Identification of ARARs is site-specific and involves a two-part analysis: a determination of whether a requirement is applicable, and if not applicable, whether it is relevant and appropriate. An ARAR is applicable if the specific terms of the law or regulation directly address the COPC, response action, or place involved at the site. If the jurisdictional requirements of the law are not met, a legal requirement may be relevant and appropriate if the circumstances are sufficiently similar to circumstances in which the law otherwise applies and is suited to the conditions of the site.

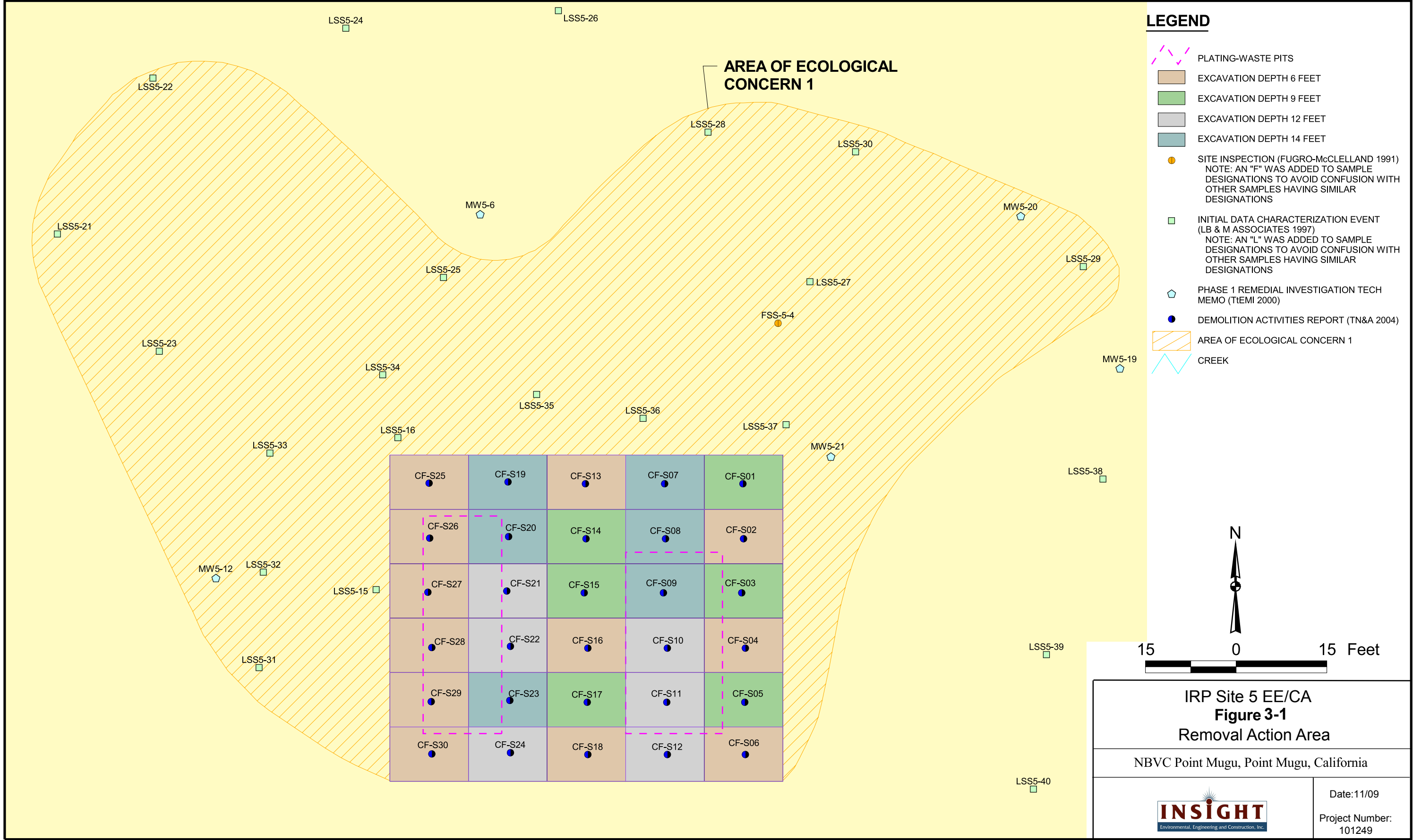
A requirement must be substantive in order to constitute an ARAR for activities conducted on-site.

In addition to ARARs, the NCP states that “to be considered” (TBC) requirements, which are non-promulgated criteria, advisories, guidance, or proposed regulations issued by the federal or state government that are not legally binding and do not have the status of potential ARARs, should be evaluated.

As the lead Federal agency, the DON has the primary responsibility for the identification of Federal ARARs for the IRP Site 5 wetland sediment site. As the lead State agencies, the DTSC and the Regional Water Quality Control Board, have the responsibility for identifying State ARARs. The process of identification of federal ARARs and solicitation of state ARARs was carried out by the DON for this EE/CA and is discussed in Appendix A.

3.6 PUBLIC PARTICIPATION REQUIREMENTS

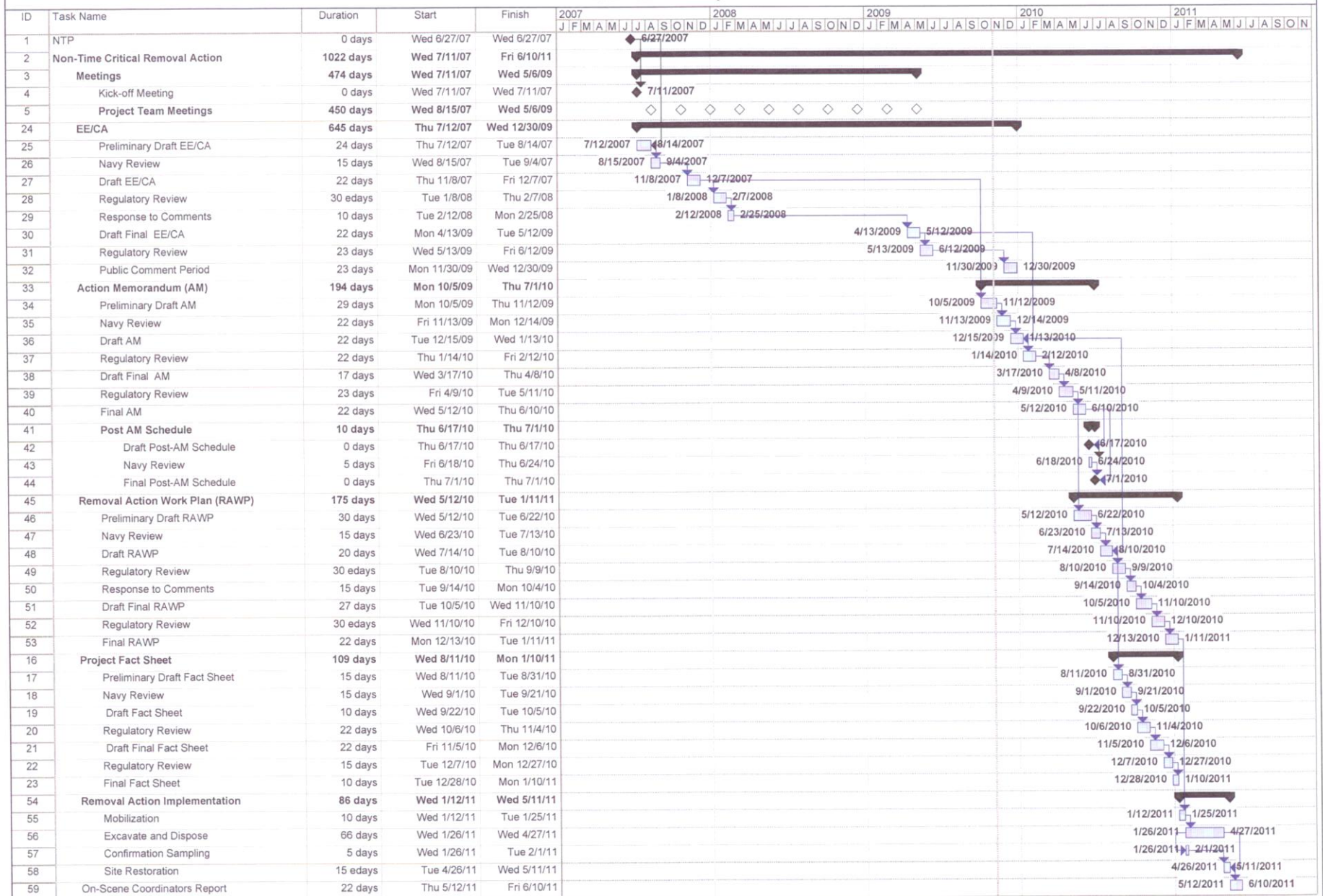
This Final EE/CA has been issued in accordance with the Community Relations Plan prepared by the Naval Base Ventura County to facilitate public involvement in the decision-making process. The public is encouraged to review and comment on the selected removal activities described in this EE/CA. In accordance with 40 CFR 300.415(n), a notice of availability, a brief description of the Final EE/CA, and a notification of the public comment period will be published in the local newspapers.



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Figure 3-2: Project Schedule
Non-Time Critical Removal Action
IRP Site 5
Naval Air Station Point Mugu



Project: Pt_Mugu_Site_5_NTRA_rev00
Date: Tue 11/3/09

Task
Progress

Summary

Milestone

Rolled Up Task

Rolled Up Progress

Rolled Up Milestone

4. IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

Based on the removal action objectives presented in the previous section, three alternatives have been developed for the wetland sediment removal action at the IRP Site 5. These alternatives are described in this section and are evaluated based on effectiveness, implementability, and cost. A No Action alternative is also evaluated for comparison purposes.

4.1 PRELIMINARY SCREENING OF REMOVAL ACTION ALTERNATIVES

A technology screening step was conducted to identify those technologies most capable of achieving the removal action objectives for the wetland sediment at the IRP Site 5. The screening was conducted using the evaluation criteria of effectiveness, implementability, and cost. Table 4-1 describes the factors and ratings used to qualitatively rate the technologies.

Alternatives involving the excavation and subsequent handling, storage, treatment, and/or disposal of contaminated sediment from the IRP Site 5 must consider the regulatory status of the excavated materials. Specifically, it is necessary to determine whether any of the materials may be classified as RCRA or non-RCRA hazardous or designated waste under California and Federal regulations.

Based on the preliminary screening of the alternatives developed for the IRP Site 5 wetland sediment, ICs and excavation and off-site disposal were reasonably effective and implementable; therefore, these two were retained for detailed evaluation. No Action alternative was retained because a no action alternative is required so as to comply with State requirements.

4.2 DETAILED EVALUATION OF REMOVAL ACTION ALTERNATIVES

After the preliminary screening of the alternatives developed for the contaminated sediment, it was determined that the alternatives presented in Table 4-2 had a reasonable estimate for effectiveness and implementability, and were therefore retained for detailed evaluation. The major components of each of these alternatives are listed in Table 4-2.

Detailed evaluation of the removal action alternatives was done both individually and comparatively, with respect to the CERCLA NTCRA evaluation criteria. The evaluation criteria fall into three categories: threshold criteria, balancing criteria, and modifying criteria. The balancing criteria, which are the focus of the EE/CA, are effectiveness, implementability, and cost. The modifying criteria, State and community acceptance, are evaluated by U.S. EPA after the public comment period.

Among the three balancing criteria of effectiveness, implementability, and cost; there are subcriteria for effectiveness and implementability. The subcriteria for effectiveness are:

- overall protection of human health and the environment;
- compliance with ARARs and other criteria, advisories, and guidance;
- short-term effectiveness;
- reduction of mobility, volume, and toxicity of contaminants through treatment; and
- long-term effectiveness and permanence.

The evaluation of the first two subcriteria considers how well the alternative will protect human health and the environment and comply with ARARs and other criteria, as well as draws on the assessments conducted for the other effectiveness subcriteria. Short-term effectiveness evaluates the effect of implementing the removal action on the community, workers, and the environment. Long-term effectiveness evaluates the magnitude of risk and the adequacy/reliability of controls to ensure the long-term effectiveness. According to NTCRA guidance, “if the non-time critical removal action

is an interim step and is expected to be followed by remedial action, this factor could be reduced in scope or deleted, if appropriate.” The removal action objectives for this removal action include reducing ecological risk associated with sediment contamination to acceptable levels.

The removal action is an interim step until the acceptable levels have been defined and the results of this removal action can be compared to those levels. If sediment concentrations in portions or all of the removal action area do not meet the acceptable levels, further removal action may be required. Therefore, the scope of evaluating the long-term effectiveness was reduced in accordance with the NTCRA guidance and focuses on the adequacy and reliability of controls. The subcriteria for implementability are:

- Technical Feasibility;
- Administrative Feasibility;
- Availability of Services and Materials;
- State (supporting agency) Acceptance; and
- Community Acceptance.

The last two evaluation subcriteria for implementability are considered modifying criteria under CERCLA. Modifying criteria are addressed by the U.S. EPA following submittal of the public review Draft Final EE/CA and subsequent public comment period and are therefore not evaluated in this EE/CA.

The cost evaluation is based on estimates for capital costs, including both direct and indirect costs. Cost estimates for the removal action alternatives were generated using Remedial Action Cost Engineering Requirements (RACER) system Version 9.1.0. The cost backup including underlying assumptions and quantities for cost estimates, and an individual cost summary for each removal action alternative considered for detailed analysis in this EE/CA are presented in Appendix B. The cost estimates were generated for removal action alternatives based on the conceptual design conducted using the available site characterization information for the IRP Site 5. The cost estimates generated in this EE/CA are for comparison purposes only and are of sufficient level of accuracy to conduct comparative analysis of removal alternatives based on costs.

Sections 4.3.1 through 4.3.3 provide the evaluation of each individual removal action alternative against the NTCRA evaluation criteria.

4.2.1 Alternative 1 – No Action

The No Action Alternative is included to comply with State requirements. This alternative provides a baseline condition if no removal action is taken. Under this alternative, none of the general response actions including excavation, and off-site treatment would be implemented for contaminated sediment at IRP Site 5, and current status of the site remains unchanged relative to contaminant concentrations.

This alternative would not be protective of the environment as it does not reduce the risk from exposure to the contaminated sediment at the site and would not attain removal action goals. The effectiveness is low because future removal actions may be required to address the contamination remaining at the site. This alternative has no effect on the toxicity, mobility, and volume of contaminants other than that obtained through the natural attenuation processes.

A detailed evaluation of this alternative based on effectiveness, implementability, and cost is presented in Section 4.3.

Table 4-1: Preliminary Screening of Alternatives

| General Response Actions | Technology Type | Technology Process Option | Technology Process Option Description | Effectiveness ^a Imple | mentability ^b Cost | ^c Screen | n g/Evaluation Comments |
|--------------------------|-----------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| No Action | None | None Available | No Action | No removal action would be implemented to reduce volume, toxicity or mobility of COC-impacted wetland sediment. It would not reduce exposure of receptors (birds and small mammals) to the impacted sediment nor would it restrict future uses or uncontrolled disturbance of the impacted sediment of AOEC 1. | Easily implementable since no action needs to be taken. | There are no costs associated with this technology. | Selected as a stand-alone alternative in compliance with the State. |
| Institutional Controls | ICs | ICs | ICs include administrative and/or legal controls that restrict access to the site and prevent exposure to hazardous substances left in place at the site, or measures that assure the continued effectiveness of the implemented remedy. | Would not reduce exposure of receptors (birds and small mammals) to the COC-impacted sediment of AOEC 1. Expected to be effective in restricting uncontrolled disturbance of the COC-impacted sediment of AOEC 1 and thereby its uncontrolled migration and redeposition. | ICs are relatively easy to implement. | Low. | Selected for alternative development. |
| Containment | Capping | Single-layer sediment cover | Forms a barrier between chemically impacted sediment and the environment. | An effective means of providing containment of underlying impacted sediment. ICs would need to be implemented concurrently to protect the cover and assure long-term effectiveness. Periodic maintenance of the cover would be required to reduce environmental and anthropogenic effects. | Rated low in implementability. A surficial cap constructed on the ground surface at AOEC 1 would extend above the surrounding area and would likely disrupt the ecological balance of AOEC 1 i.e. would permanently change the habitat. | A single-layer sediment cover would be low in cost relative to other process options. | A single-layer sediment cover is eliminated from further consideration based primarily on low implementability. |
| | | Sediment/synthetic membrane cover | Forms a barrier between chemically impacted sediment and the environment. | An effective means of providing containment of underlying impacted sediment. ICs would need to be implemented concurrently to protect the geosynthetic liner and assure long-term effectiveness. Periodic maintenance would be required to reduce environmental and anthropogenic effects. | Rated low in implementability. A surficial cap constructed on the ground surface at AOEC 1 would extend above the surrounding area and would likely disrupt the ecological balance of AOEC 1 i.e. would permanently change the habitat. | A sediment/synthetic membrane cover would be higher in cost than the single-layer sediment cover. | A sediment/synthetic membrane cover is eliminated from further consideration based primarily on low implementability. |
| Removal | Mechanical excavation | Excavation and off-site disposal | Contaminated sediment is removed and stockpiled for disposal. Some pretreatment might be required in order to meet LDRs for metals. | Removal of sediment is considered effective and applicable for the COC-impacted sediment of AOEC 1. Sediment removal would reduce risks associated with exposure of the COC-impacted sediment of AOEC 1 to receptors (birds and small mammals). | Rated moderate in implementability. Mechanical excavators such as the clamshell bucket and the backhoe appear to be suitable for the removal of the COC-impacted sediment of AOEC 1. Dewatering of the excavated sediment would be necessary and would add complexities to the removal alternatives. Construction activities could result in temporary damage to the environment. | Disposal costs for excavated sediment can be high, depending on volume. See Disposal. | Retained for use as a component of removal alternatives. |
| | | Excavation and <i>ex situ</i> treatment | Contaminated sediment is removed and stockpiled for <i>ex situ</i> treatment. | Removal of sediment is considered effective and applicable for the COC-impacted sediment of AOEC 1. Sediment removal would reduce risks associated with exposure of receptors (birds and small mammals) to the COC-impacted sediment of AOEC 1. | Mechanical excavators appear to be suitable for the removal of the COC-impacted sediment of AOEC 1. Dewatering of the excavated sediment would be necessary and would add complexities to the removal alternatives. Construction activities could result in temporary damage to the environment. | See <i>ex situ</i> treatment. | |
| Disposal | Off-site disposal | Open-water discharge | Involves the removal and transportation of sediment for off-site disposal in the form of unrestricted discharge, level-bottom capping, or CAD. | Protectiveness would be achieved by off-site disposal of the COC-impacted sediment of AOEC 1. | Rated low in implementability. Chemically impacted sediment would be prohibited from unrestricted discharge. Level-bottom capping and CAD would require construction of underwater containment structures and capping. These options have significant permitting components, and approval may not be received within a practical time frame, or may not be received at all. Monitoring and annual maintenance would be required. Construction activities could result in temporary damage to the environment. | Costs would be significantly higher compared with disposal at existing upland disposal facilities (i.e., landfills). | Eliminated from further consideration based primarily on low implementability. |
| | | Disposal facility | Involves the removal, stockpiling, dewatering, chemical profiling, and transportation of sediment to an off-site permitted and regulated commercial facility for ultimate disposal. | Protectiveness would be achieved by off-site disposal of the COC-impacted sediment of AOEC 1. If sediment is RCRA hazardous, it would be disposed at hazardous waste landfills. Nonhazardous and non-RCRA (California) hazardous sediment could be disposed at nonhazardous waste landfills. | Rated moderate in mplementability. A large volume of sediment would have to be transported through local communities. Dewatering of the excavated sediment would be necessary and would add complexities to the alternative. Construction activities could result in temporary damage to the environment. | Costs would be moderate compared with on-site treatment options, depending on the volume of impacted sediment. | Retained for use as a component of removal alternatives. |

| General Response Actions | Technology Type | Technology Process Option | Technology Process Option Description | Effectiveness ^a Imple | mentability ^b Cost | ^c Screenin | g/Evaluation Comments |
|--------------------------|------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| | | Beneficial reuse | Involves the removal, stockpiling, dewatering, chemical profiling, and transportation of sediment to an off-site location for ultimate disposal in the form of beach nourishment/replenishment, land application, land creation, general fill, or landfill daily cover. | Protectiveness would be achieved by off-site disposal of the COC- impacted sediment of AOEC 1. | Rated low in implementability. Due to the expected salt content and the concentrations of COCs in the AOEC 1 sediment, it is unlikely that the sediment would be considered suitable for beneficial reuse. | Costs would be similar to or higher compared with disposal at existing upland disposal facilities (i.e., landfills). | Eliminated from further consideration based primarily on low implementability. |
| <i>In situ</i> treatment | Biological treatment | Phytoremediation | A plant-based technology that uses selected plants to remove, transfer, stabilize, and destroy contaminants typically in upland soils. | Effective in areas with metals in shallow soils, but pilot-scale testing would be required to assess treatment effectiveness and time to achieve RAOs. The process may not be effective for chromium, and COC concentrations exceeding the SMOs are present at depths below the effective depths of phytoremediation. The COCs present in the sediment may be transferred into the leaves and stems of plants that are food sources. | Rated low in implementability. Phytoremediation is unlikely to be compatible with the current and future use of AOEC 1 as a wildlife refuge. Planting and harvesting the phytoremediation plants is expected to be too disruptive to the salt marsh habitat at AOEC 1, and introduction of nonindigenous plant species to the salt marsh may be prohibited. | Overall cost is high compared with other process options. | Eliminated from further consideration based primarily on uncertain effectiveness and low implementability. |
| | Physical treatment | EK separation | Applies a low-intensity direct current between ceramic electrodes, typically through an upland soil mass. The charged particles are mobilized, causing them to move toward the electrodes. | Site-specific treatability studies of this technology have been conducted at AOEC 1, and EK separation proved to have limited effectiveness. | Rated low in implementability. Installation of the EK equipment for the demonstration project at IR Site 5 caused significant biological disturbance. Additional biological impacts would be expected if this technology were applied on a larger scale. | Overall cost is high compared with other process options. | Eliminated from further consideration based primarily on low implementability and limited effectiveness. |
| <i>Ex situ</i> treatment | Chemical, biological, physical treatment | Extraction, vitrification, immobilization | Contaminated sediment is removed, stockpiled, and subjected to <i>ex situ</i> treatment. | Few <i>ex situ</i> sediment treatment technologies have been demonstrated at full scale. Bench-scale treatability studies would be required prior to fullscale implementation in the field. | Rated low in implementability. Few <i>ex situ</i> sediment treatment technologies have been demonstrated at full scale. Bench-scale treatability studies would be required prior to full-scale implementation in the field. Given the limited regional experience and the uncertainties about effectiveness, <i>ex situ</i> sediment treatment may not be acceptable and approval may not be received within a practical time frame, or may not be received at all. Concerns include available space and site selection for a full-scale treatment project and identification of a receiver project/site for the treated end product. | <i>Ex situ</i> treatment costs could be high. | <i>Ex situ</i> treatment is eliminated from further consideration based primarily on low implementability. |

Notes:
^a Evaluation factors included ability of the process option to reduce volume, toxicity, and mobility of perchlorate contamination, and attain the RAOs; potential impacts to human-health and the environment during implementation of the process option; and whether the process is reliable and proven for remediation of perchlorate.
^b Evaluation factors included ability to obtain regulatory approval; availability of equipment and skilled workers; extensiveness of knowledge required to implement the process option; and need for treatment or disposal of process waste.
^c Each process option was rated (high, low or medium) based on cost relative to other process options in the same technology type based on the engineering judgment.

AOEC area of ecological concern
CAD confined aquatic disposal
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
EK electrokinetic
IC institutional controls
IR Installation Restoration (Program)
LDR and-disposal restriction
NCP National Oil and Hazardous Substances Pollution Contingency Plan
RAO removal action objective
RCRA Resource Conservation and Recovery Act

Table 4-2: Major Components of Selected Alternatives

| Response Action Alternative | Description |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 – No Action | No action |
| 2 – Institutional Controls | Government controls Proprietary controls Enforcement tools with IC components Informational tools |
| 3 – Excavation of Sediment with Off-Site Treatment and Disposal | Excavation of 2,700 bank cubic yards of cadmium and chromium contaminated sediment Off-site transport Disposal of soil after treatment at an approved disposal/recycling facility |

4.2.2 Alternative 2 – Institutional Controls

Under Alternative 2, ICs would be designed and put in place to restrict site use and the uncontrolled disturbance and release of the COC-impacted sediment of AOEC 1. The COC-impacted sediment of AOEC 1 would remain in place. No removal measures would be implemented to reduce concentrations of COCs in the sediment, alter transport/exposure pathways, or reduce/limit risks to receptors (birds and small mammals).

ICs would be designed and put in place, and will include the following elements:

- prohibitions on the alteration, disturbance, or removal of surface or subsurface AOEC 1 sediment, including but not limited to construction, without prior review and written approval from the Navy and the regulatory agencies
- provisions for access for future monitoring and inspection activities by the Navy and regulatory agencies
- requirements and procedures to notify the Navy and the regulatory agencies of any changes in conditions of AOEC 1 that could potentially compromise the remedy or endanger its ecology and its habitats

The actual ICs to be employed would be outlined in conceptual form in the Action Memorandum and described in detail in subsequent removal design/removal action documentation. The effectiveness of the ICs would be reviewed periodically as part of the CERCLA 5-year review process.

The estimated net present-worth of Alternative 2 using the Remedial Action Cost Engineering Requirements (RACERTM) 2007 system Version 9.1.0 is \$937,000. The present-worth analysis assumed an operation and maintenance (O&M) period of 30 years and a discount rate of 2.8 percent.

A detailed evaluation of this alternative based on effectiveness, implementability, and cost is presented in Section 4.3.

4.2.3 Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal

Alternative 3 would involve excavation of COC-impacted sediment at IRP Site 5 (Figure 3-1) to an average depth of approximately 6 feet bgs, dewatering and chemical profiling of the excavated

sediment, loading and transporting the impacted sediment to the landfill(s), and backfilling the excavation. The action represents an interim solution to the problem of contaminated sediment at the site. A permanent solution will be conducted at a later date.

The excavated sediment would be temporarily stored in staging piles as for dewatering. Chemical profiling will be conducted for the dewatered sediment and the water generated as a result of sediment dewatering. Dewatered sediment will be loaded into trucks to be transported and disposed of at an approved disposal facility. The water generated as a result of sediment dewatering, if necessary, will be sent to an approved disposal facility. Following excavation, confirmation sampling would be conducted for cadmium, chromium, copper, nickel, lead, and silver to ensure that target cleanup goals based on removal action objectives are attained and are protective of birds and small mammals. Excavated areas would then be backfilled with clean sediment and compacted. Advice for the reconstitution of the salt marsh will be solicited from the California Department of Fish and Game. Surficial portions of the backfill would be designed and constructed with materials similar to the physical composition of the surrounding sediment bed, with the intent that the salt marsh ecological community would recolonize the backfill surface.

As part of the NBVC Point Mugu INRMP, the Navy has an ongoing program that includes annual monitoring of salt marsh bird's-beak habitat at NBVC Point Mugu. According to the 2007 survey, the closest mapped habitat is south of Beach Road and approximately 950 feet west of the IRP Site 5 boundary. The most recent survey will be consulted prior to removal action. Excerpts from the 2007 survey are provided as Attachment B of the Final FS (BEI 2008).

As a cooperative plan, the INRMP entails coordination with two regulatory agencies, the U.S. Fish and Wildlife Service and the California Department of Fish and Game. In accordance with the INRMP, Navy owned lands are managed to ensure that projects carried out by the Navy do not jeopardize the continued existence of salt marsh bird's-beak, and to help foster the recovery of salt marsh bird's-beak.

This alternative would attain the removal action objectives for the IRP Site 5. Removal of the contaminated sediment would effectively minimize potential risks or other impacts to the environment. The action represents a permanent solution to the problem of contaminated sediment at the site. Based on the extent of sediment, the estimated volume of COC-impacted for sediment to be excavated during sediment removal is 2,700 bank cubic yards. In addition, for EE/CA purposes it is assumed that 15 percent of the excavated sediment will be classified as RCRA-hazardous waste and 85 percent of the excavated sediment will be classified as non-hazardous waste and will require treatment and disposal at an approved disposal facility.

The estimated net present worth of Alternative 3 is \$1,342,000. The detailed costs for implementation of Alternative 3 using RACERTM 2007 system Version 9.1.0 are presented in Appendix B. The principal cost items are excavation of contaminated sediment, dewatering of the contaminated sediment, transportation, and disposal at an approved off-site disposal facility.

A detailed evaluation of this alternative based on effectiveness, implementability, and cost is presented in Section 4.3.

4.3 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

The alternatives analyzed in Section 4.2 are compared with each other in Table 4-3 to evaluate the relative performance of each alternative in relation to each of the criteria and to specify the basis for rejection of the alternative. The criteria used in this comparison are effectiveness, implementability,

and cost. Based on the scores of this evaluation, scores are assigned to each evaluated criteria under each alternative and summed in Table 4-4.

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Table 4-3 Summary of Detailed and Comparative Analysis for Removal Action Alternatives

| Criterion | | Alternative 1– No Action | Alternative 2 – Institutional Controls | Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal |
|------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effectiveness | Overall Protection of Human Health and the Environment | Low No additional protection is provided. The risk due to contaminated sediment is not addressed, and the potential for exposure to birds and small mammals exists. | Low The risk due to contaminated sediment is not addressed, and the potential for exposure to birds and small mammals exists. | High Protectiveness achieved by excavation and off-site disposal of all COC-impacted sediment from the IRP Site 5. Eliminates the potential for exposure of receptors (birds and small mammals) to the impacted sediment. |
| | Compliance with ARARs | Low The No Action Alternative is not a removal action, so this alternative is not compliant with ARARs. | High Compliance with ARARs can be ensured by proper implementation of this alternative. | High Compliance with action and location-specific ARARs can be ensured by proper implementation of this alternative. |
| | Long-Term Effectiveness and Permanence | Low Alternative 1 would have little long-term effectiveness since the risk of exposure to contaminants will still exist. | Low to Moderate ICs would include restrictions on activities that lead to exposure of birds and small mammals to COC-impacted sediment. However, there is potential for migration of the impacted sediment, and the potential for exposure of receptors exists. | High High long-term effectiveness at the site, as the contaminated sediment will be removed completely. |
| | Reduction in Toxicity, Mobility, and Volume Through Treatment | Low Not considered a treatment remedy, since there is no reduction in toxicity, mobility, or volume of the contaminated sediments. | Low No reduction in toxicity, mobility, or volume of the contaminated sediments. | High Excavation and off-site disposal of COC-impacted sediment will reduce toxicity, volume, and mobility of the on-site sediment. |
| | Short-Term Effectiveness | High No excavation and construction activities to increase the risk to workers or general public. | Moderate to High No significant construction activity that exposes workers to COC-impacted sediment would be implemented. | Moderate Activities including excavation, on-site temporary storage, and off-site transportation may expose workers to impacted sediment. |
| Implementability | Technical Feasibility & Administrative Feasibility | High No implementability issues associated with this alternative since no actions are performed. | Moderate to High ICs are relatively easily implementable. | Moderate Excavation and off-site disposal activities will require average technical and administrative effort. |
| | State Acceptance | State acceptance of this alternative will be assessed following the public review process. | State acceptance of this alternative will be assessed following the public review process. | State acceptance of this alternative will be assessed following the public review process. |
| | Community Acceptance | Community acceptance of this alternative will be assessed following the public review process. | Community acceptance of this alternative will be assessed following the public review process. | Community acceptance of this alternative will be assessed following the public review process. |
| Cost | Cost (\$) | High There is no cost associated with this alternative. | Moderate to High Least expensive of the removal action alternatives. | Moderate Most expensive removal action alternative. |

Notes:
Alternative that costs the least is rated the highest
ARARs = applicable or relevant and appropriate requirements

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Table 4-4: Scoring of Removal Action Alternatives

| Criterion | Alternative 1 – No Action | Alternative 2– Institutional Controls | Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal |
|---------------------------------------------------------------------|------------------------------|------------------------------------------|--------------------------------------------------------------------------------------|
| Effectiveness | | | |
| Overall Protection of Human Health and the Environment | Low (0) | Low (0) | High (4) |
| Compliance with ARARs | Low (0) | High (4) | High (4) |
| Long-Term Effectiveness and Permanence | Low (0) | Low to Moderate (1) | High (4) |
| Reduction in Toxicity, Mobility, and Volume Through Treatment | Low (0) | Low (0) | High (4) |
| Short-Term Effectiveness | High (4) | Moderate to High (3) | Moderate (2) |
| Implementability | High (4) | Moderate to High (3) | Moderate (2) |
| Cost (\$) | High (4) | Moderate to High (3) | Moderate (2) |
| Overall Effectiveness Score | 12 | 14 | 22 |

Notes:

Scores were assigned as follows:

| | |
|------------------|---|
| Low | 0 |
| Low to Moderate | 1 |
| Moderate | 2 |
| Moderate to High | 3 |
| High | 4 |

ARARs = applicable or relevant and appropriate requirements

5. RECOMMENDED REMOVAL ACTION ALTERNATIVE

This EE/CA was prepared in accordance with current U.S. EPA (U.S. EPA 1993) and U.S. Navy guidance documents for a NTCRA under CERCLA. The purpose of this EE/CA was to identify and analyze alternative removal actions to address the sediment contamination at the IRP Site 5. Three alternatives were identified, evaluated, and ranked:

Alternative 1 – No Action

Alternative 2 – Institutional Controls

Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal

Based on the comparative analyses of the removal action alternatives completed in Section 4.3, the recommended removal action alternative is Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal.

As described in Table 4-3, Alternative 3 would reduce toxicity, mobility, and volume of cadmium- and chromium in wetland sediment, providing long-term effectiveness and protection to the environment. Alternative 3 meets the removal action objectives and, is easily implementable, provides the best balance between costs and overall effectiveness based upon the above-mentioned factors (see Table 4-4).

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Appendix A
Applicable or Relevant and Appropriate
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ACRONYMS AND ABBREVIATIONS

| | |
|-----------------|------------------------------------------------------------------|
| ACL | alternative concentration limit |
| AM | action memorandum |
| AOEC | area of ecological concern |
| AR | Administrative Record |
| ARARs | applicable or relevant and appropriate requirements |
| BACT | best available control technology |
| bgs | below ground surface |
| Cal. Civ. Code | California Civil Code |
| Cal. Code Regs. | California Code of Regulations |
| Cal/EPA | California Environmental Protection Agency |
| COC | chemical of concern |
| C.F.R. | Code of Federal Regulation |
| CWA | Clean Water Act |
| div. | Division |
| DON | Department of the Navy |
| DTSC | Department of Toxic Substances Control |
| FFA | Federal Facilities Agreement |
| Fed. Reg | Federal Register |
| HSWA | Hazardous and Solid Waste Amendments |
| IRP | Installation Restoration Program |
| MCAS | Marine Corps Air Station El Toro |
| mg/L | milligrams per liter |
| µg/L | micrograms per liter |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| RCRA | Resource Conservation and Recovery Act |
| § | section |
| SWRCB | State Water Resource Control Board |
| RWQCB | Regional Water Quality Control Board |
| SCAQMD | South Coast Air Quality Management District |
| STLC | soluble threshold limit concentration |
| subdiv. | subdivision |
| TBC | to be considered |
| TCLP | toxicity characteristic leaching procedure |
| tit. | title |
| TTLC | total threshold limit concentration |
| U.S.C. | United States Code |
| WET | waste extraction test |

A1.INTRODUCTION

This appendix identifies and evaluates potential federal and state of California applicable or relevant and appropriate requirements (ARARs) from the universe of regulations, requirements, and guidance and sets forth the Department of the Navy (DON) determinations regarding those potential ARARs for each response action alternative retained for detailed analysis in this Engineering Evaluation/Cost Analysis (EE/CA) for the Installation Restoration Program (IRP) Site 5, the Old Area 6 Shops, located on Naval Base Ventura County (NBVC) Point Mugu. NBVC Point Mugu is located in Point Mugu, Ventura County, California, approximately 50 miles northwest of Los Angeles. Response action alternatives have been developed and evaluated in this EE/CA for the contaminated sediment.

This evaluation includes an initial determination of whether the potential ARARs actually qualify as ARARs and a comparison for stringency between the federal and state regulations to identify the controlling ARARs. The identification of ARARs is an iterative process. The final determination of ARARs (no longer “potential” ARARs) will be made by the DON in the record of decision (ROD) or action memorandum (AM), after public review, as part of the response action selection process.

A1.1 SUMMARY OF CERCLA AND NCP REQUIREMENTS

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 *United States Code* [42 U.S.C.] Section [§] 9621[d]), as amended, states that remedial actions on CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate.

Section 121(d) of CERCLA (42 U.S.C. § 9621[d]), as amended, states that remedial actions at CERCLA sites must attain (or the decision document must justify the waiver of) any federal or more stringent state environmental standards, requirements, criteria, or limitations determined to be legally applicable or relevant and appropriate. Although Section 121 of CERCLA does not itself expressly require that CERCLA removal actions comply with ARARs, the United States Environmental Protection Agency (U.S. EPA) has promulgated a requirement in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) mandating that CERCLA removal actions “. . . shall, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental or facility siting laws” (Title 40 *Code of Federal Regulations* [40 C.F.R.] § 300.415[j]). It is DON policy to follow this requirement. Certain specified waivers may be used for removal actions, as is the case with remedial actions.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address the situation at a CERCLA site. The requirement is applicable if the jurisdictional prerequisites of the standard show a direct correspondence when objectively compared to the conditions at the site. An applicable federal requirement is an ARAR. An applicable state requirement is an ARAR only if it is more stringent than federal ARARs.

If the requirement is not legally applicable, then the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations similar to the circumstances of the proposed response action and are well suited to the conditions of the site (U.S. EPA 1988a). A requirement must be determined to be both relevant *and* appropriate to be considered an ARAR.

The criteria for determining relevance and appropriateness are listed in 40 C.F.R. § 300.400(g)(2) and include the following:

- the purpose of both the requirement and the CERCLA action
- the medium regulated or affected by the requirement and the medium contaminated or affected at the CERCLA site
- the substances regulated by the requirement and the substances found at the CERCLA site
- the actions or activities regulated by the requirement and the response action contemplated at the CERCLA site
- any variances, waivers, or exemptions of the requirement and their availability for the circumstances at the CERCLA site
- the type of place regulated and the type of place affected by the release or CERCLA action
- the type and size of structure or facility regulated and the type and size of structure or facility affected by the release or proposed in the CERCLA action
- any consideration of use or potential use of affected resources in the requirement and the use or potential use of the affected resources at the CERCLA site

According to CERCLA ARARs guidance (U.S. EPA 1988a), a requirement may be “applicable” or “relevant and appropriate,” but not both. ARARs must be identified on a site-specific basis and involve a two-part analysis: first, a determination whether a given requirement is applicable; then, if it is not applicable, a determination whether it is both relevant and appropriate. It is important to explain that some regulations may be applicable or, if not applicable, may still be relevant and appropriate. When the analysis determines that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable (U.S. EPA 1988a).

Tables included in this appendix present each potential ARAR with an initial determination of ARAR status (i.e., applicable, relevant and appropriate, or not an ARAR). For the determination of relevance and appropriateness, the pertinent criteria were examined to determine whether the requirements addressed problems or situations sufficiently similar to the circumstances of the release or response action contemplated, and whether the requirement was well suited to the site. A negative determination of relevance and appropriateness indicates that the requirement did not meet the pertinent criteria. Negative determinations are documented in the tables of this appendix and are discussed in the text only for specific cases.

To qualify as a state ARAR under CERCLA and the NCP, a state requirement must be:

- a state law or regulation,
- an environmental or facility siting law or regulation,
- promulgated (of general applicability and legally enforceable),
- substantive (not procedural or administrative),

- more stringent than federal requirements,
- identified in a timely manner, and
- consistently applied.

To constitute an ARAR, a requirement must be substantive. Therefore, only the substantive provisions of requirements identified as ARARs in this analysis are considered to be ARARs. Permits are considered to be procedural or administrative requirements. Provisions of generally relevant federal and state statutes and regulations that were determined to be procedural or nonenvironmental, including permit requirements, are not considered to be ARARs. CERCLA Section 121(e)(1), 42 U.S.C. § 9621(e)(1), states, “No Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with this section.” The term *on-site* is defined for purposes of this ARARs discussion as “the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action” (40 C.F.R. § 300.5).

Nonpromulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. Such requirements may, however, be useful and are “to be considered” (TBC). TBC (40 C.F.R. § 300.400[g][3]) requirements complement ARARs but do not override them. They are useful for guiding decisions regarding cleanup levels or methodologies when regulatory standards are not available.

Pursuant to U.S. EPA guidance (U.S. EPA 1988a), ARARs are generally divided into three categories: chemical-, location-, and action-specific requirements. This classification was developed to aid in the identification of ARARs; some ARARs do not fall precisely into one group or another. ARARs are identified on a site basis for remedial actions where CERCLA authority is the basis for cleanup.

As the lead federal agency, the DON has primary responsibility for identifying federal ARARs at IRP Site 5. Potential federal ARARs that have been identified for the IRP Site 5 EE/CA are discussed in Section A1.2.2. Pursuant to the definition of the term on-site in 40 C.F.R. § 300.5, the on-base areas that are part of the response action for the contaminated sediment includes sediment within the Area of Ecological Concern (AOEC) 1 footprint with chemicals of concern (COCs) concentrations exceeding the sediment management objectives (SMOs). The COCs in wetland sediment at IRP Site 5 are cadmium, chromium, copper, lead, nickel, and silver. Any additional areas in the proximity of IRP Site 5 required for implementing response action for the impacted sediment are also considered “on-site” areas. The sediment excavation and sediment dewatering facilities are defined as “on-site” for the purpose of this ARAR analysis. The areas used by trucks for transport of sediments within the boundaries of NBVC Port Mugu are also defined as “on-site.” The transportation and disposal at an off-site disposal facility are considered off-site actions. Regulatory requirements that apply to off-site actions are not ARARs. Off-site actions (i.e. off-site transportation and disposal) are required to comply with applicable requirements only and are not required to comply with relevant and appropriate requirements identified as ARARs for on-site actions.

Identification of potential state ARARs was initiated through DON requests that the California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC) identify potential state ARARs, an action described in more detail in Section A1.2.3. Potential state ARARs that have been identified for IRP Site 5 are discussed below.

A1.2 METHODOLOGY DESCRIPTION

The process of identifying and evaluating potential federal and state ARARs is described in this subsection.

A1.2.1 General

As the lead federal agency, the DON has primary responsibility for identification of potential ARARs for IRP Site 5. In preparing this ARARs analysis, the DON undertook the following measures, consistent with CERCLA and the NCP:

- identified federal ARARs for each response action alternative addressed in the EE/CA, taking into account site-specific information for IRP Site 5
- reviewed potential ARARs identified by the state to determine whether they satisfy CERCLA and NCP criteria that must be met in order to constitute state ARARs
- evaluated and compared federal ARARs and their state counterparts to determine whether state ARARs are more stringent than the federal ARARs or are in addition to the federally required actions
- reached a conclusion as to which federal and state ARARs are the most stringent and/or “controlling” ARARs for each alternative

As outlined in Section 4 of this EE/CA, removal action alternatives have been developed and evaluated for the contaminated sediment at IRP Site 5. The removal action objectives (RAOs) for the contaminated sediment are presented in Section 3.3 and include the following:

- Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment.

Removal action alternatives retained for detailed analysis in this EE/CA report and designed to attain RAOs for the contaminated sediment include:

- Alternative 1: No Action
- Alternative 2: Institutional Controls
- Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal

A1.2.2 Identifying and Evaluating Federal ARARs

The DON is responsible for identifying federal ARARs as the lead federal agency under CERCLA and the NCP. The final determination of federal ARARs will be made when the DON issues the AM. The federal government implements a number of federal environmental statutes that are the source of potential federal ARARs, either in the form of the statutes or regulations promulgated thereunder. Examples include the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), the Toxic Substances Control Act (TSCA), and their implementing regulations. See NCP preamble at 55 *Federal Register* (Fed. Reg.) 8764–8765 (1990) for a more complete listing.

The DON reviewed the proposed response action and alternatives against all potential federal ARARs, including but not limited to those set forth at 55 Fed. Reg. 8764–8765 (1990), in order to determine if they were applicable or relevant and appropriate using the CERCLA and NCP criteria and procedures for ARARs identification by lead federal agencies.

A1.2.3 Identifying and Evaluating State ARARs

The process of identifying and evaluating potential state ARARs by the state and the DON is described in this subsection.

A1.2.3.1 SOLICITATION OF STATE ARARS UNDER NCP

U.S. EPA guidance (U.S. EPA 1988b) recommends that the lead federal agency consult with the state when identifying state ARARs for response actions. In essence, the CERCLA/NCP requirements at 40 C.F.R. § 300.515 for response actions provide that the lead federal agency request that the state identify chemical- and location-specific state ARARs upon completion of site characterization. The requirements also provide that the lead federal agency request identification of all categories of state ARARs (chemical-, location-, and action-specific) upon completion of identification of remedial alternatives for detailed analysis. The state must respond within 30 days of receipt of the lead federal agency requests. The remainder of this subsection documents the DON's efforts to date to identify and evaluate state ARARs.

The DON followed the process set forth in 40 C.F.R. § 300.515 in seeking state assistance with identification of state ARARs.

A1.2.3.2 CHRONOLOGY OF EFFORTS TO IDENTIFY STATE ARARS

The following chronology summarizes the DON's efforts to obtain state assistance with identification of state ARARs for the response action at IRP Site 5. Key correspondence between the DON and the state agencies relating to this effort has been included in the Administrative Record for this EE/CA.

Identification of potential state ARARs was initiated by the DON in formal written requests dated 27 November 2002 to the DTSC, California Department of Fish and Game (CDFG), and California Regional Water Quality Control Board (RWQCB), Los Angeles Region to identify ARARs for IRP Site 5 (Attachment A, ARARs Correspondence). This evaluation was made as part of the evaluation of response actions during the preparation of the feasibility study. The DTSC subsequently forwarded the DON's ARARs request to other state and Ventura County agencies.

The DTSC received responses from the Ventura County Air Pollution Control District (VCAPCD), California Department of Transportation (CALTRANS), and CDFG, dated 16 July 2003 to 05 August 2003. The DTSC provided a listing of potential state ARARs and TBC state advisories, guidance, and criteria, along with copies of responses it received, in a written response to Southwest Division Naval Facilities Engineering Command (SWDIV) dated 30 September 2003 (Attachment A).

The response provided by CALTRANS does not provide potential ARARs for response action at IRP Site 5 and states that activity at the location does not appear to have the potential to impact local State Route 1.

In a letter to SWDIV dated 15 November 2002 (Attachment A), preceding the DON's ARARs request, the RWQCB Los Angeles Region stated the following points applicable to the determination of potential state ARARs for IRP Site 5 and other NBVC Point Mugu sites.

- The RWQCB will pursue a basin plan amendment for the dedesignation of the Municipal and Domestic Supply beneficial uses for the semiperched aquifer under NBVC Point Mugu.
- Because this aquifer appears to be in hydraulic continuity with deeper aquifers currently under agricultural use landward of the facility, the RWQCB does not plan to reevaluate the Agricultural designation of the aquifer.
- If the Municipal and Domestic Supply designations are removed for the semiperched aquifer, the goal of cleanup for naturally occurring pollutants would be to achieve natural background levels, and for man-made pollutants it would be to achieve nondetectable levels.

The RWQCB has not yet provided input regarding potential state ARARs in response to the DON's request.

A1.3 OTHER GENERAL ISSUES

General issues identified during the evaluation of ARARs for IRP Site 5 are discussed in the following subsections.

A1.3.1 General Approach to Requirements of the Federal Resource Conservation and Recovery Act

RCRA is a federal statute passed in 1976 to meet four goals: protection of human health and the environment, reduction of waste, conservation of energy and natural resources, and elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions (LDRs), and technical requirements. RCRA, as amended, contains several provisions that are potential ARARs for CERCLA sites.

Substantive RCRA requirements are applicable to response actions on CERCLA sites if the waste is a RCRA hazardous waste, and either:

- the waste was initially treated, stored, or disposed after the effective date of the particular RCRA requirement; or
- the activity at the CERCLA site constitutes treatment, storage, or disposal as defined by RCRA (U.S. EPA 1988a).

The preamble to the NCP indicates that state regulations that are components of a federally authorized or delegated state program are generally considered federal requirements and potential federal ARARs for the purposes of ARARs analysis (55 Fed. Reg. 8666, 8742 [1990]). The state of California received approval for its base RCRA hazardous waste management program on 23 July 1992 (57 Fed. Reg. 32726 [1992]). The state of California "Environmental Health Standards for the Management of Hazardous Waste," set forth in Title 22 *California Code of Regulations*, Division 4.5 (Cal. Code Regs. tit. 22, div. 4.5), were approved by U.S. EPA as a component of the federally authorized state of California RCRA program. On 26 September 2001, California received final authorization of its revised State Hazardous Waste Management Program from U.S. EPA (63 Fed. Reg. 49118 [2001]).

The regulations of Cal. Code Regs. tit. 22, div. 4.5 are therefore a source of potential federal ARARs for CERCLA response actions. The exception is when a state regulation is "broader in scope" than the corresponding federal RCRA regulations. In that case, such regulations are not considered part

of the federally authorized program or potential federal ARARs. Instead, they are purely state law requirements and potential state ARARs.

The U.S. EPA 23 July 1992 notice approving the state of California RCRA program (57 Fed. Reg. 32726 [1992]) specifically indicated that the state regulations addressed certain non-RCRA, state-regulated hazardous wastes that fell outside the scope of federal RCRA requirements. Cal. Code Regs. tit. 22, div. 4.5 requirements would be potential state ARARs for such non-RCRA, state-regulated wastes.

A key threshold question for the ARARs analysis is whether the contaminants at IRP Site 5 constitute federal hazardous waste as defined under RCRA and the state's authorized program or qualify as non-RCRA, state-regulated hazardous waste. A discussion of waste characterization is included in Section A1.4.

A1.4 WASTE CHARACTERIZATION

Selection of ARARs involves the characterization of wastes as described below.

A1.4.1 RCRA Hazardous Waste Determination

Federal RCRA hazardous waste determination is necessary to determine whether a waste is subject to RCRA requirements at Cal. Code Regs. tit. 22, div. 4.5 and other state requirements at Cal. Code Regs. tit. 23, div. 3, Chapter (ch.) 15. The first step in the RCRA hazardous waste characterization process is to evaluate contaminated media at the site(s) and determine whether the contaminant constitutes a "listed" RCRA waste. The preamble to the NCP states that ". . . it is often necessary to know the origin of the waste to determine whether it is a listed waste and that, if such documentation is lacking, the lead agency may assume it is not a listed waste" (55 Fed. Reg. 8666, 8758 [1990]).

This approach is confirmed in U.S. EPA guidance for CERCLA compliance with other laws (U.S. EPA 1988a) as follows.

To determine whether a waste is a listed waste under RCRA, it is often necessary to know the source. However, at many Superfund sites, no information exists on the source of wastes. The lead agency should use available site information, manifests, storage records, and vouchers in an effort to ascertain the nature of these contaminants. When this documentation is not available, the lead agency may assume that the wastes are not listed RCRA hazardous wastes, unless further analysis or information becomes available that allows the lead agency to determine that the wastes are listed RCRA hazardous wastes.

RCRA hazardous wastes that have been assigned U.S. EPA hazardous waste numbers (or codes) are listed in Cal. Code Regs. tit. 22, § 66261.30–66261.33. The lists include hazardous waste codes beginning with the letters "F," "K," "P," and "U."

Knowledge of the exact source of a waste is required for source-specific listed wastes ("K" waste codes). Some knowledge of the nature or source of the waste is required even for listed wastes from nonspecific sources, such as spent solvents ("F" waste codes) or commercial chemical products ("P" and "U" waste codes). These listed RCRA hazardous wastes are restricted to commercially pure chemicals used in particular processes such as degreasing.

P and U wastes cover only unused and unmixed commercial chemical products, particularly spilled or off-specification products (U.S. EPA 1991a). Not every waste containing a P or U chemical is a hazardous waste. To determine whether a CERCLA investigation-derived waste contains a P or U

waste, there must be direct evidence of product use. In particular, all the following criteria must be met. The chemicals must be:

- discarded (as described in 40 C.F.R. § 261.2[a][2]),
- either off-specification commercial products or a commercially sold grade,
- not used (i.e., soil contaminated with spilled unused wastes is a P or U waste), and
- the sole active ingredient in a formulation.

The former plating-waste pits at IRP Site 5 were used between 1948 and 1965 for the aeration and consolidation of liquid waste streams from the plating, machine, heat treatment, and engineering shops of Area 6.

Available historical information and storage records were reviewed during the Initial Assessment Study (IAS) (SCS and Landau Associates 1985). Wastes reportedly disposed in the former plating-waste pits (or at Area 3, the Beach Road slough) included plating rinsate (containing cyanide and metals such as chromium, copper, zinc, and tin), chromic acid, chrome etch (solution), carbon remover, carbon tetrachloride, trichloroethylene, photograph fixer and developer (containing silver, potassium bromide, and phenols), cutting oil, and waste oil. These wastes were generated from processes similar in nature to processes that generate listed wastes. However, specifics on the initial composition and use of these constituents is unknown. In addition, wastes generated from these processes predate promulgation of regulations that define hazardous wastes. Therefore, the listed waste codes do not apply.

The second step in the RCRA hazardous waste characterization process is to evaluate potential hazardous characteristics of the waste. The evaluation of characteristic waste is described in U.S. EPA guidance as follows (U.S. EPA 1988a).

Under certain circumstances, although no historical information exists about the waste, it may be possible to identify the waste as RCRA characteristic waste. This is important in the event that (1) remedial alternatives under consideration at the site involve on-site treatment, storage, or disposal, in which case RCRA may be triggered as discussed in this section; or (2) a remedial alternative involves off-site shipment. Since the generator (in this case, the agency or responsible party conducting the Superfund action) is responsible for determining whether the wastes exhibit any of these characteristics (defined in 40 C.F.R. § 261.21–261.24), testing may be required. The lead agency must use best professional judgment to determine, on a site-specific basis, if testing for hazardous characteristics is necessary.

In determining whether to test for the toxicity characteristic using the extraction procedure (EP) toxicity test, it may be possible to assume that certain low concentrations of waste are not toxic. For example, if the total waste concentration in soil is 20 times or less the EP toxicity concentration, the waste cannot be characteristic hazardous waste. In such a case, RCRA requirements would not be applicable. In other instances, where it appears that the substances may be characteristic hazardous waste (ignitable, corrosive, reactive, or EP toxic), testing should be performed.

Hazardous waste characteristics, as defined in 40 C.F.R. § 261.21–261.24, are commonly referred to as ignitability, corrosivity, reactivity, and toxicity. California environmental health standards for the management of hazardous waste set forth in Cal. Code Regs. tit. 22, div. 4.5 were approved by U.S.

EPA as a component of the federally authorized California RCRA program. Therefore, the characterization of RCRA waste is based on the state requirements.

The characteristics of ignitability, corrosivity, reactivity, and toxicity are defined in Cal. Code Regs. tit. 22, § 66261.21–66261.24. According to Cal. Code Regs. tit. 22, § 66261.24(a)(1)(A), “A waste that exhibits the characteristic of toxicity pursuant to subsection (a)(1) of this section has the EPA Hazardous Waste Number specified in Table I of this section which corresponds to the toxic contaminant causing it to be hazardous.” Table I assigns hazardous waste codes beginning with the letter “D” to wastes that exhibit the characteristic of toxicity; D waste codes are limited to “characteristic” hazardous wastes.

According to Cal. Code Regs. tit. 22, § 66261.10, waste characteristics can be measured by an available standardized test method or be reasonably classified by generators of waste based on their knowledge of the waste provided that the waste has already been reliably tested or if there is documentation of chemicals used. The sediment contamination at IRP Site 5 is not ignitable, corrosive, or reactive, as defined in Cal. Code Regs. tit. 22, § 66261.21–66261.23. This determination was based on knowledge of the nature and concentrations of COPCs in the sediment.

The requirements at Cal. Code Regs. tit. 22, § 66261.24 list the toxic contaminant concentrations that determine the characteristic of toxicity. The concentration limits are in milligrams per liter (mg/L). These units are directly comparable to total concentrations in waste groundwater and surface water. For waste soils, these concentrations apply to the extract or leachate produced by the toxicity characteristic leaching procedure (TCLP).

A waste is considered hazardous if the contaminants in the wastewater or in the soil TCLP extract equal or exceed the TCLP limits. TCLP testing is required only if total contaminant concentrations in soil equal or exceed 20 times the TCLP limits because TCLP uses a 20-to-1 dilution for the extract (U.S. EPA 1988a). The maximum concentrations of chemicals of potential concern (COPCs) in the sediment samples collected from IRP Site 5 were compared to TCLP limits at Cal. Code Regs. tit. 22 § 66261.24(a)(1). This comparison showed that concentrations of a few metals in the sediment samples exceeded 20 times their TCLP concentrations. This indicates that the excavated sediment at IRP Site 5 has a potential to exceed criteria for the RCRA toxicity characteristic for these metals. Therefore, TCLP testing will be required for the excavated sediment to evaluate if it exhibits toxicity characteristic of RCRA hazardous waste.

The dewatering of sediments under Alternative 3 would generate wastewater that is proposed to be discharged to tidal creek. The relatively high concentrations of COPCs in IRP Site 5 sediment indicate that wastewater generated during sediment dewatering could exhibit toxicity characteristic of RCRA hazardous waste. Therefore, an analysis of concentrations of COPCs in wastewater would be required to determine if it exhibits toxicity characteristic of RCRA hazardous waste.

A1.4.2 California-Regulated, Non-RCRA Hazardous Waste

A waste determined not to be a RCRA hazardous waste may still be considered a state-regulated non-RCRA hazardous waste. The state’s RCRA program is broader in scope in its hazardous waste determination. Cal. Code Regs. tit. 22, § 66261.24(a)(2) lists the total threshold limit concentrations (TTLCs) and the soluble threshold limit concentrations (STLCs) for non-RCRA hazardous waste. The state applies its own leaching procedure, the Waste Extraction Test (WET), which uses a different acid reagent and has a different dilution factor (tenfold). There are other state requirements that may be broader in scope than federal ARARs for identifying non-RCRA wastes regulated by the state. These may be potential ARARs for wastes not covered under federal ARARs. See additional subsections of Cal. Code Regs. tit. 22, § 66261.24. A waste is considered hazardous if its total

concentrations exceed the TTLCs or if the extract concentrations from the WET exceed the STLCs. A WET is required when the total concentrations exceed the STLC but are less than the TTLCs (Cal. Code Regs. tit. 22, div. 4.5, ch. 11, Appendix [app.] II [b]).

The maximum concentrations of COPCs in the sediment samples collected from IRP Site 5 were compared to TTLCs and 10 times the STLCs at Cal. Code Regs. tit. 22 § 66261.24(a)(2). This comparison showed that concentrations of a few metals in the sediment samples exceeded 10 times its STLC. This indicates that the sediment generated as a result of excavation at IRP Site 5 has a potential to exceed toxicity characteristic of the California-regulated, non-RCRA hazardous waste. Therefore, further evaluation will be required for the excavated sediment dredged from IRP Site 5 to evaluate if they exhibit toxicity characteristic of California-regulated, non-RCRA hazardous waste. This may include analysis of total concentrations of COPCs or WET.

The dewatering of sediments under Alternative 3 would generate wastewater that is proposed to be discharged to IRP Site 5 tidal creek. The relatively high concentrations of COPCs in IRP Site 5 sediment indicate that wastewater generated during sediment dewatering could exhibit toxicity characteristic of the California-regulated, non-RCRA hazardous waste. Therefore, an analysis of concentrations of COPCs in wastewater would be required to determine if it exhibits toxicity characteristic of California-regulated, non-RCRA hazardous waste.

A2.CHEMICAL-SPECIFIC ARARS

Chemical-specific ARARs are generally health- or risk-based numerical values or methodologies applied to site-specific conditions that result in the establishment of a cleanup level. Many potential ARARs associated with particular response alternatives (such as closure or discharge) can be characterized as action-specific but include numerical values or methodologies to establish them so they fit in both categories (chemical- and action-specific). To simplify the comparison of numerical values, most action-specific requirements that include numerical values are included in this chemical-specific section and, if repeated in the action-specific section, the discussion refers back to this section.

This section presents the ARARs determination conclusions addressing numerical values for surface water and sediment and a summary of the potential ARARs followed by a more detailed discussion of the ARARs for surface water and sediment.

Potential federal and state chemical-specific ARARs are summarized in Tables A2-1 and A2-2, respectively, which are at the end of this section.

A2.1 SUMMARY OF ARARS CONCLUSIONS BY MEDIUM

Surface water and sediment are the environmental medium potentially affected by the IRP Site 5 response actions. The conclusions for ARARs pertaining to these media are presented in the following sections.

A2.1.1 Surface Water ARARs Conclusions

Surface water is not a medium of concern for the IRP Site 5 removal action. The COC-impacted sediment is not expected to affect surface water quality under current conditions. However, the proposed excavation activities may cause sediment COCs to be suspended into the surface water in the area of dredging. Therefore, the national ambient water quality standards, National Toxics Rule (NTR) and California Toxics Rule (CTR) at 40 C.F.R. § 131.36(b) and 131.38, respectively, have been identified as potential ARARs for the excavation activities and for the discharge of water generated as a result of sediment dewatering to tidal creek proposed under Alternative 3.

In addition, federal and state requirements that define hazardous waste are potential ARARs for hazardous waste evaluation of water generated as a result of sediment dewatering proposed under Alternative 3. The federal requirements include Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100. The state requirements include Cal. Code Regs. tit. 22 § 66261.22(a)(3) and (4), § 66261.24(a)(2)–(a)(8), § 66261.101, § 66261.3(a)(2) (C), and § 66261.3(a)(2) (F).

A2.1.2 Sediment ARARs Conclusions

Federal and state requirements that define hazardous waste are potential ARARs for hazardous waste evaluation of excavated and dewatered sediment generated as a result of implementation of Alternative 3 at IRP Site 5. The federal requirements include Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100. The state requirements include Cal. Code Regs. tit. 22 § 66261.22(a)(3) and (4), § 66261.24(a)(2)–(a)(8), § 66261.101, § 66261.3(a)(2) (C), and § 66261.3(a)(2) (F).

A2.1.3 Air ARARs Conclusions

Air is not a medium of concern in this EE/CA Report; therefore, federal or state requirements for air were not identified as potential chemical-specific ARARs for IRP Site 5. However, air requirements

pertaining to the generation of dust during removal action are discussed in Section A4 as potential federal or state action-specific ARARs for site surface improvements and closure activities.

A2.2 DETAILED DISCUSSION OF ARARs BY MEDIUM

The following subsections provide a detailed discussion of federal and state ARARs by medium.

A2.2.1 Surface Water ARARs

Surface water is not a medium of concern for this removal action. Discharge to surface water bodies is included as an element of a potential response action for IRP Site 5. Potential federal ARARs for surface water are detailed in the following subsections.

A2.2.1.1 FEDERAL

Federal requirements evaluated as potential ARARs for surface water are discussed in the subsections below.

RCRA Hazardous Waste Evaluation Requirements

As described in Section A1.4.1, RCRA hazardous waste evaluation will be performed for wastewater generated as a result of dewatering of the sediments proposed under Alternative 3. The RCRA requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are potential ARARs for this evaluation because they define RCRA hazardous waste. Based on the existing knowledge of the nature and concentrations of COPCs in the sediment, the wastewater from sediment dewatering would not be ignitable, corrosive, or reactive, as defined in Cal. Code Regs. tit. 22, § 66261.21–66261.23. The relatively high concentrations of COPCs in IRP Site 5 wetland sediment (greater than 20 times TCLP limits) indicates that wastewater from sediment dewatering could exhibit toxicity characteristic of RCRA hazardous waste. However, an analysis of total concentrations of COPCs in wastewater would be required to confirm if it exhibits toxicity characteristic of RCRA hazardous waste per the requirements of 66261.24(a)(1).

Water Quality Standards

On 22 December 1992, U.S. EPA promulgated federal water quality standards under the authority of the federal CWA Section 303(c)(4)(B), 33 U.S.C., ch. 26, § 1313, in order to establish water-quality standards required by the CWA where the state of California and other states had failed to do so (57 Fed. Reg. 60848 [1992]). These standards have been amended over the years in the Federal Register including the amendments of the NTR (60 Fed. Reg. 22228 [1995]). The water quality standards, as amended, are codified at 40 C.F.R. § 131.36. The water quality standards contained in 40 C.F.R. § 131.36(a) are potential applicable federal ARARs for discharge to or cleanup of surface water.

U.S. EPA promulgated a rule on 18 May 2000 to fill a gap in California's water quality standards. The gap was created in 1994 when a state court overturned the state's water quality control plans that contained water quality criteria for priority toxic pollutants. The rule, commonly called the CTR, is codified at 40 C.F.R. § 131.38. These federal criteria are legally applicable in the state of California for inland surface waters and enclosed bays and estuaries for all purposes and programs under the CWA. They are also potential applicable requirements for groundwater that discharges to surface waters (see Section A2.2.1.1).

These standards of the CTR apply to the state's designated uses and "supersede any criteria adopted by the State, except when State regulations contain criteria which are more stringent for a particular use in which case the State's criteria will continue to apply."

The CTR and NTR are not applicable for setting cleanup goals for sediment since the sediment is not a potential threat to surface water under current conditions. Substantive provisions are potentially applicable for the potential for COCs to enter surface water during excavation of sediment and for the discharge of water generated as a result of sediment dewatering to tidal creek proposed under Alternative 3.

Other CWA Requirements

CWA 301(b) requires that all direct dischargers meet technology-based requirements including the best control technology (BCT) and the best available technology (BAT) economically achievable. These requirements are made on a case-by-case basis using best professional judgment.

The CWA 301(b) constitutes potential ARAR for the discharge of water generated as a result of sediment dewatering to tidal creek proposed under Alternative 3. The requirements of CWA 301(b) are usually administered by the State under the NPDES permit program. The RWQCB has not yet identified any NPDES permit as potential ARAR for surface water discharge. CERCLA actions are not subject to permit requirements under Section 121(e) of CERCLA (42 U.S.C. ch. 103 § 9621[e][1]). Therefore, following identification of NPDES permit as potential ARAR, the substantive requirements of the permit will be evaluated to determine if they constitute TBCs for compliance with federal CWA requirements such as meeting the BCT/BAT requirements.

National Ambient Water Quality Criteria

Section 304(a)(1) of the CWA (33 U.S.C. § 1314[a][1]) directs U.S. EPA to publish and periodically update ambient water quality criteria. The NAWQC are updated in the *Federal Register*. The latest list of the NAWQC through June 2000 was published in the *Federal Register* on 10 December 1998 with amendments in 64 Fed. Reg. 19781 (1999). If criteria are not listed for a pollutant, U.S. EPA does not have any national recommended water quality criteria.

These criteria are to reflect the latest scientific knowledge on the identifiable effects of pollutants on public health and welfare, aquatic life, and recreation. These criteria serve as guidance to states in adopting water quality standards under Section 303(c) of the CWA that protect human life and aquatic life from acute and chronic effects.

Since the water quality standards for COPCs at IRP Site 5 have not been identified yet by the State as potential ARARs, NAWQC may be potential ARARs for surface water discharge.

A2.2.1.2 STATE

State requirements evaluated as potential ARARs for surface water are discussed in the subsections below.

RCRA Requirements

State RCRA requirements included within the U.S. EPA-authorized RCRA program for California are considered to be potential federal ARARs and are discussed above. When state regulations are either broader in scope or more stringent than their federal counterparts, they are considered potential state ARARs. State requirements such as the non-RCRA, state-regulated hazardous waste requirements may be potential state ARARs because they are not within the scope of the federal ARARs (57 Fed. Reg. 60848). The Cal. Code Regs. tit. 22, div. 4.5 requirements that are part of the state-approved RCRA program would be potential state ARARs for non-RCRA, state-regulated hazardous wastes.

The site waste characteristics need to be compared to the definition of non-RCRA, state-regulated hazardous waste. The non-RCRA, state-regulated waste definition requirements at Cal. Code Regs. tit. 22, § 66261.24(a)(2) are potential state ARARs for determining whether other RCRA requirements are potential state ARARs. This section lists the TTLCs and STLCs. The site waste may be compared to these thresholds to determine whether it meets the characteristics for a non-RCRA, state-regulated hazardous waste. The relatively high concentrations of COPCs in IRP Site 5 wetland sediment indicates that there is a possibility that wastewater generated during sediment dewatering exhibits toxicity characteristic of the California-regulated, non-RCRA hazardous waste. However, an analysis of total concentrations of COPCs in wastewater and comparison with thresholds listed in Cal. Code Regs. tit. 22, § 66261.24(a)(2) would be required to determine if it exhibits toxicity characteristic of California-regulated, non-RCRA hazardous waste.

A2.2.2 Sediment ARARs

The following types of contaminated sediment are anticipated during various stages of implementation of removal action Alternative 3 presented in this EE/CA:

- Excavated sediment from the wetlands
- Dewatered sediment (obtained following dewatering of the excavated sediment)

A threshold question for sediment ARARs is whether or not the sediment either *in situ* or excavated would be classified as federal hazardous waste as defined by RCRA or as non-RCRA, state-regulated, hazardous waste. Contaminated sediments that are subject to a permit that has been issued under Section 404 of the CWA or under Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA, also known as the Ocean Dumping Act) are excluded from the definition of federal hazardous waste under the Dredged Material Exclusion of 40 C.F.R. § 261.4(g). Permits under either law will govern management of sediments destined for off-site discharge into waters of the United States. Any discharge of contaminated sediments that occurs in upland areas that have no return flow to waters of the United States is not subject to the exclusion of 40 C.F.R. § 261.4(g). (See 63 Fed. Reg. § 65874 for further details). If these sediments are determined to be hazardous waste, the appropriate RCRA requirements will apply.

Potential ARARs for federal and state RCRA hazardous waste evaluation for excavated and dewatered sediment are discussed in Section 2.2.1.1 and 2.2.1.2, respectively.

A2.2.2.1 FEDERAL

Federal requirements evaluated as potential ARARs for sediment are discussed in the subsections below.

RCRA Hazardous Waste Evaluation

U.S. EPA and the states have been slow to develop criteria for the protection of human or ecological receptors in sediments. While U.S. EPA proposed national sediment criteria in 1998 to set pollution thresholds that sediments could not exceed, those criteria were withdrawn after consultation with the U.S. Army Corps of Engineers (USACE). Accordingly, the only federal ARARs for sediments are RCRA hazardous waste and LDRs and water quality standards and NAWQC under the CWA. The applicability of RCRA requirements depends on whether the sediments contain listed or characteristic RCRA hazardous waste; whether the waste was initially treated, stored, or disposed after the effective date of the particular RCRA requirement; and whether the activity at the site constitutes generation, treatment, storage, or disposal as defined by RCRA. Excavation of sediments containing RCRA hazardous waste constitutes generation of waste, to which RCRA requirements apply. RCRA requirements may also be relevant and appropriate even if they are not applicable.

Examples include activities that are similar to those defined as RCRA treatment, storage, or disposal for waste that is similar to RCRA hazardous waste.

Determination of whether a waste is a RCRA hazardous waste can be made by comparing site waste to the definition of RCRA hazardous waste. RCRA requirements at Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 are potential ARARs because they define RCRA hazardous waste. A waste can meet the definition of hazardous waste if it has the toxicity characteristic of hazardous waste. This determination is made by using the TCLP. The maximum concentrations allowable for the TCLP listed in Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B) are potential federal ARARs for determining whether the site has hazardous waste. If the site waste has concentrations exceeding these values it is determined to be a characteristic RCRA hazardous waste. See Section A1.4.1 for a more complete discussion of hazardous waste determination.

Dredged Material Quality Assessment Guidance

Since the chemical-specific requirements for disposal of dredged material are specific to the action of dredging, these requirements are addressed in more detail in Section A4.2.

A2.2.2.2 STATE

State requirements evaluated as potential ARARs for sediment are discussed in the subsections below.

RCRA Requirements

State RCRA requirements included within the U.S. EPA-authorized RCRA program for California are considered to be potential federal ARARs and are discussed above. When state regulations are either broader in scope or more stringent than their federal counterparts, they are considered potential state ARARs. State requirements such as the non-RCRA, state-regulated hazardous waste requirements may be potential state ARARs because they are not within the scope of the federal ARARs (57 Fed. Reg. 32726 [1992]).

The site waste characteristics need to be compared to the definition of non-RCRA, state-regulated hazardous waste. The non-RCRA, state-regulated waste definition requirements at Cal. Code Regs. tit. 22, § 66261.24(a)(2) are potential state ARARs for determining whether other RCRA requirements are potential state ARARs. This section lists the TTLCs and STLCs. The site waste may be compared to these thresholds to determine whether it meets the characteristics for a non-RCRA, state-regulated hazardous waste. As described in Section A1.4.1, excavated sediment from IRP Site 5 wetlands proposed under Alternative 3 may exhibit toxicity characteristics of California-regulated, non-RCRA hazardous waste. Therefore, further evaluation including analysis of total concentrations of COPCs or WET may be required to determine if they exhibit toxicity characteristic of California-regulated, non-RCRA hazardous waste per the requirements of Cal. Code Regs. tit. 22, § 66261.24(a)(2)

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Table A2-1
Potential Federal Chemical-Specific^a ARARs by Medium

| Requirement | Prerequisite | Citation ^b | ARAR Determination | Comments |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SEDIMENT | | | | |
| Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901–6991[i])^c | | | | |
| Groundwater protection standards: Owners/operators of RCRA TSD facilities must comply with conditions designed to assure that hazardous constituents entering groundwater from a regulated unit do not exceed concentration limits for COCs set forth under Cal. Code Regs. tit. 22, § 66264.94 in the uppermost aquifer underlying the waste management area beyond the point of compliance. | A regulated unit that receives or has received hazardous waste before 26 July 1982 or regulated units that ceased receiving hazardous waste prior to 26 July 1982 where constituents in or derived from the waste may pose a threat to human health or the environment | Cal. Code Regs. tit. 22, § 66264.94(a)(1), (a)(3), (c), (d), and (e) | Not an ARAR | The cited regulation is not an ARAR since IRP Site 5 does not pose a current threat to groundwater. |
| Definition of RCRA hazardous waste. | Waste. | Cal. Code Regs. it. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 | Applicable | Applicable for determining whether waste is hazardous. The hazardous waste determination will be required for excavated sediment and water generated as a result of sediment dewatering (see Section A1.4.1 for details). |

Table A2-1 (continued)

| Requirement | Prerequisite | Citation ^b | ARAR Determination | Comments |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A solid waste is characterized as toxic, based on the TCLP, if the waste exceeds the TCLP maximum concentrations. | Waste. | 40 C.F.R. pt. 261.24(a) Cal. Code Regs. tit. 22, § 66261.24(a)(1)(B) | | Applicable for determining whether waste is hazardous. |
| SURFACE WATER | | | | |
| Clean Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)^c | | | | |
| National ambient water quality standards. | Discharges to waters of the United States. | 40 C.F.R. § 131.36(b) and 131.38 | Applicable | Substantive provisions are potentially applicable for the potential for COCs to enter surface water during the excavation of sediment and for the discharge of water generated as a result of sediment dewatering to tidal creek proposed under Alternative 3. Not an ARAR for setting sediment cleanup goals. |
| Effluent limitations that meet technology-based requirements, including BCPCT and BAT economically achievable. | Discharges to waters of The United States. | 33 U.S.C., ch. 26, § 1311(b)(2) (CWA § 301[b]) | Relevant and Appropriate | The CWA 301(b) constitutes potential ARAR for the discharge of water generated as a result of sediment dewatering to tidal creek proposed under Alternative 3. The requirements of CWA 301(b) are usually administered by the State under the NPDES permit program. The RWQCB has not yet identified any NPDES permit as potential ARAR for surface water discharge. CERCLA actions are not subject to permit requirements under Section 121(e) of CERCLA (42 U.S.C. ch. 103 § 9621[e][1]). Therefore, following identification of NPDES permit as potential ARAR, the substantive requirements of the permit will be evaluated to determine if they constitute TBCs for compliance with federal CWA requirements such as meeting the BCT/BAT requirements. |
| Water quality criteria. | Discharges to waters of the United States and groundwater. | 33 U.S.C., ch. 26, § 1314(a) and 42 U.S.C., ch. 103, § 9621(d)(2) 64 Fed. Reg. 19,781 | Relevant and Appropriate | The substantive provisions of this regulation are relevant and appropriate for discharge of water generated as a result of sediment dewatering to the tidal creek. |

Table A2-1 (continued)

| Requirement | Prerequisite | Citation ^b | ARAR Determination | Comments |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| (22 April 1999) | | | | |
| Resource Conservation and Recovery Act (42 U.S.C., ch. 82, §§ 6901–6991[i])^c | | | | |
| Defines RCRA hazardous waste. A solid waste is characterized as toxic, based on the TCLP, if the waste exceeds the TCLP maximum concentrations. | Waste. | Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100 | Applicable | Applicable for determining whether water generated as a result of sediment dewatering is hazardous (see Section A2.2.2.1 for details). |

Notes:

- ^a many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables
- ^b only the substantive provisions of the requirements cited in this table are potential ARARs
- ^c statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs

Acronyms/Abbreviations:

ACL – alternative concentration limit
 ARAR – applicable or relevant and appropriate requirement
 Cal. Code Regs. – *California Code of Regulations*
 CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
 C.F.R. – *Code of Federal Regulations*
 ch. – chapter
 Fed. Reg. – *Federal Register*
 NCP – National Oil and Hazardous Substances Pollution Contingency Plan
 POC – point of compliance
 RCRA – Resource Conservation and Recovery Act
 § – section
 SMCL – secondary maximum contaminant level
 TCLP – toxicity characteristic leaching procedure
 tit. – title
 U.S.C. – *United States Code*

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A2-10

Table A2-2
Potential State Chemical-Specific^a ARARs by Medium

| Requirement | Prerequisite | Citation ^b | ARAR Determination | Comments |
|-------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SEDIMENT and SURFACE WATER | | | | |
| Cal/EPA Department of Toxic Substances Control | | | | |
| Definition of “non-RCRA hazardous waste.” | Waste. | Cal. Code Regs. tit. 22 § 66261.22(a)(3) and (4), § 66261.24(a)(2)–(a)(8), § 66261.101, § 66261.3(a)(2) (C), and § 66261.3(a)(2) (F) | Applicable | Applicable for determining whether waste (e.g. excavated sediment and water generated as a results of sediment dewatering) meets the definition of California-regulated, non-RCRA hazardous waste. |

Notes:

- ^a many potential action-specific ARARs contain chemical-specific limitations and are addressed in the action-specific ARAR tables
- ^b only the substantive provisions of the requirements cited in this table are potential ARARs
- ^c statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only pertinent substantive requirements of the specific citations are considered potential ARARs

A3.LOCATION-SPECIFIC ARARs

Potential location-specific ARARs are identified and discussed in this section. The discussions are presented based on various attributes of the site location, such as whether it is within a floodplain. Additional surveys will be performed in connection with the response action design and implementation to confirm location-specific ARARs where inadequate siting information currently exists, or in the event of changes to planned facility locations.

A3.1 SUMMARY OF LOCATION-SPECIFIC ARARs

Wetlands protection, biological resources, and coastal resources are the resource categories relating to location-specific requirements potentially affected by the IRP Site 5 response actions. The conclusions for ARARs pertaining to these resources are presented in the following sections.

A3.1.1 Wetlands Protection and Floodplains Management Conclusions

Wetlands constitute approximately 2,500 acres of NBVC Point Mugu, approximately 56 percent of the total 4,490 acres of the facility. IRP Site 5 is located adjacent to Mugu Lagoon, and the northern portion of the site is largely occupied by associated salt marsh wetlands around the lagoon; therefore, federal requirements to protect wetlands have been identified as potential ARARs for site management. Proposed removal action for IRP Site 5 sediment would be conducted in a manner protective of these resources, including measures to minimize the potential for inadvertent discharge. For this reason, federal requirements to protect wetlands at 40 C.F.R. § 6.302(a) and CWA Section 404 (33 U.S.C. § 1344) have been identified as potentially relevant and appropriate for removal action at IRP Site 5. Measures would be taken to prevent or mitigate potential impacts to wetlands.

A3.1.2 Biological Resources Conclusions

Substantive provisions of the Endangered Species Act (ESA) of 1973 at 16 U.S.C. § 1536(a), (h)(1)(B) and the Migratory Bird Treaty Act (MBTA) of 1972 at 16 U.S.C. § 703 were determined to be potentially relevant and appropriate ARARs for the proposed removal action work at IRP Site 5.

Substantive provisions of *California Fish and Game Code* (Cal. Fish & Game Code) § 2080 were determined to be potentially relevant and appropriate ARARs for proposed removal actions at IRP Site 5 for protecting the peregrine falcon and Belding's savannah sparrow which may potentially use the site and are not protected by the federal ARARs. Substantive provisions of Cal. Fish & Game Code § 3503.5 were determined to be potentially relevant and appropriate ARARs for protecting the peregrine falcon. Substantive provisions of Cal. Fish & Game Code § 3511 were determined to be potentially relevant and appropriate ARARs for protecting the peregrine falcon, lightfooted clapper rail, California brown pelican, and California least tern.

Biological resources and sensitive habitats at NBVC Point Mugu and Mugu Lagoon were described in the Integrated Natural Resources Management Plan for NBVC (TtEMI 2002). Federal endangered or threatened species have been identified for habitats in the vicinity of Mugu Lagoon, including IRP Site 5. Of these species, the salt marsh bird's beak (federal endangered plant) and light-footed clapper rail (federal endangered bird) have been observed in habitat at IRP Site 5. Several migratory birds are reported or expected to use NBVC Point Mugu, which is on the Pacific Flyway, and may use IRP Site 5, depending on their foraging habits.

Removal action would be designed to minimize potential effects on endangered or threatened species. The light-footed clapper rail occasionally nests approximately 500 feet northeast of IRP Site 5. The nesting season of the light-footed clapper rail would be taken into account in scheduling and implementing removal action, with a preference for removal action activities to take place in the postfledgling/pre-pairing season.

Navy biologists execute a natural resource window exclusion (nominally from 01 April through 15 September) each year upon observing nesting. Typically, this exclusion has been either no work during the window or noise restrictions, dependant on the distance of the nest to the site. This exclusion rule is instituted in consultation with the United States Fish and Wildlife Service (USFWS) as part of the NBVC Point Mugu INRMP.

Similarly, the potential occupancy period for migratory birds that frequent Mugu Lagoon and IR Site 5 will be taken into consideration.

A3.1.3 Coastal Resources Conclusions

The Coastal Zone Management Act (CZMA) (16 U.S.C. §§ 1451–1464) requires that all federal activities affecting the coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state management programs. Considering the location of the site, both federal and state regulations regarding activities in a coastal zone are considered to be potential ARARs for IRP Site 5.

The removal action proposed for IRP Site 5 sediment would not be inconsistent with the policies and goals of the coastal plans, which include limiting bay filling and maintaining wetlands, marshes, and mudflats to the fullest extent possible to conserve wildlife, abate pollution, and protect the beneficial uses of the bay. In acknowledging and conforming, as necessary, to the substantive requirements, many of the goals and policies of the state coastal management program would also be met. The removal action can be implemented in a manner that would improve the environment of the site without potential adverse impact to the coastal environment of NBVC Point Mugu.

A3.2 DETAILED DISCUSSION OF ARARs

The following subsections provide a detailed discussion of federal and state ARARs by location-specific resources. Pertinent and substantive provisions of the potential ARARs listed and described below were reviewed to determine whether they are potential federal or state ARARs for the for the contaminated sediment at the IRP Site 5, located at Naval Base Ventura County (NBVC) Point Mugu.

Requirements that are determined to be ARARs or TBCs are identified in Table A3-1 (federal) and Table A3-2 (state) at the end of this section. ARARs determinations are presented in the column with the heading “ARAR Determination.” Determinations of status for location-specific ARARs were generally based on maps or lists included in the regulation or prepared by the administering agency. References to the document or agency consulted are provided in the “Comments” column and may be provided in footnotes to the table. Specific issues concerning some of the requirements are discussed in the following sections.

A3.2.1 Cultural Resources ARARs

Pertinent and substantive provisions of the following federal and state laws and regulations were reviewed to determine whether they would be potential location-specific ARARs for removal action at IRP Site 5:

- National Historic Preservation Act of 1966, as amended (16 U.S.C. § 470–470x-6, 36 C.F.R. pt. 800, and 40 C.F.R. § 6.301[b])
- Archaeological and Historic Preservation Act (16 U.S.C. § 469–469c-1 and 40 C.F.R. § 6.301[c])
- Historic Sites, Buildings, and Antiquities Act of 1935 (16 U.S.C. §§ 461–467 and 40 C.F.R. § 6.301[a])
- Archaeological Resources Protection Act of 1979, as amended (Pub. L. No. 96-95 and 16 U.S.C. § 470aa–470mm)]

No cultural sites requiring protection have been identified in the vicinity of IRP Site 5. Table A3-1 summarizes the federal requirements evaluated for cultural resources.

A3.2.1.1 NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED

Pursuant to Sections 106 and 110(f) of the National Historic Preservation Act (NHPA) (16 U.S.C. § 470–470x-6, and its implementing regulations [36 C.F.R. pt. 800]) as amended, CERCLA remedial actions are required to take into account the effects of remedial activities on any historic properties included on or eligible for inclusion on the National Register of Historic Places (National Register) [<http://tps.cr.nps.gov/nhl/>]. The National Register is a list of districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. Section 110(f) of the NHPA of 1966 as amended, requires that before approval of any federal undertaking that may directly and adversely affect any National Historic Landmark, the head of the responsible federal agency will, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to the landmark, and will afford the Advisory Council a reasonable opportunity to comment on the undertaking.

Buildings or other structures in the vicinity of IRP Site 5 are of World War II or later vintage (SCS and Landau Assoc. 1985). One archaeological site, a Chumash Indian burial, was identified during construction near IRP Site 8 and the east end of Runway 9-27, approximately 5,000 feet north of IRP Site 5. This is the only site assessed for inclusion on the National Register (Battelle 2000). The requirements of NHPA are therefore not identified as potential ARARs for IRP Site 5.

A3.2.1.2 ARCHAEOLOGICAL AND HISTORIC PRESERVATION ACT

The Archaeological and Historic Preservation Act, 16 U.S.C. § 469–469c-1, provides for the preservation of historical and archaeological data that might otherwise be lost as a result of dam construction or alterations of the terrain. If activities in connection with any federal construction project or federally approved project may cause irreparable loss to significant scientific, prehistorical, or archaeological data, the act requires the agency undertaking that project to preserve the data or request the Department of the Interior (DOI) to do so. This act differs from the NHPA in that it encompasses a broader range of resources than those listed on the National Register and mandates only the preservation of the data (including analysis and publication).

Buildings or other structures in the vicinity of IRP Site 5 are of World War II or later vintage (SCS and Landau Assoc. 1985). One archeological site, a Chumash Indian burial, was identified during construction near IRP Site 8 and the east end of Runway 9-27, approximately 5,000 feet north of IRP Site 5. None of the other 12 historic sites identified at NBVC Point Mugu are located on or in the vicinity of IRP Site 5. The degree of made-land and prior development in the site area further reduces the likelihood of as yet unidentified cultural resources being present. The proposed removal action for IRP Site 5 is not considered likely to cause a loss of historical or archaeological data, and Archaeological and Historic Preservation Act requirements are not considered potential ARARs.

A3.2.1.3 HISTORIC SITES, BUILDINGS, AND ANTIQUITIES ACT OF 1935

The purpose of the Historic Sites, Buildings, and Antiquities Act (16 U.S.C. §§ 461–467) and its implementing regulations (40 C.F.R. § 6.301[c]) is to encourage the long-term preservation of nationally significant properties that illustrate or commemorate the history and prehistory of the United States, including historic landmarks (36 C.F.R. pt. 65) and natural landmarks (36 C.F.R. pt. 62). Properties designated as “National Historic Landmarks” in California are listed in the National Register [<http://tps.cr.nps.gov/nhl/>]. Natural landmarks are nationally significant examples of a full range of ecological and geological features that constitute the nation’s natural heritage. In conducting an environmental review of a proposed action, the responsible official shall consider the existence and location of natural landmarks using information provided by the National Park Service pursuant to 36 C.F.R. §

62.6(d) to avoid undesirable impacts on such landmarks. These requirements are not substantive and are not potential ARARs. However, if it is determined that areas to be disturbed during the response action are potentially eligible for the National Natural Historic Landmark Program, the State Historic Preservation Officer should be contacted.

None of the 12 historic buildings or structures identified at NBVC Point Mugu are located on or in the vicinity of IRP Site 5. The requirements of the Historic Sites, Buildings, and Antiquities Act are therefore not considered potential ARARs for IRP Site 5 removal action.

A3.2.1.4 ARCHAEOLOGICAL RESOURCES PROTECTION ACT OF 1979

Pub. L. No. 96-95 (16 U.S.C. § 470aa–470mm) was enacted in 1979 and amended in 1988 and applies to all lands to which the fee title is held by the United States. The purpose of this statute is to provide for the protection of archaeological resources on federal and Indian lands. The act prohibits unauthorized excavation, removal, damage, alteration, or defacement of archaeological resources located on public lands unless such activity is pursuant to a permit issued under 16 U.S.C. § 470cc.

One archaeological site, a Chumash Indian burial, was identified during construction near IRP Site 8 and the east end of Runway 9-27, approximately 5,000 feet north of IRP Site 5. The degree of made-land and prior development in the site area further reduces the likelihood of as yet unidentified cultural resources being present. The proposed removal action for IRP Site 5 is therefore not considered likely to cause a loss of historical or archaeological data. The requirements of the Archaeological Resources Protection Act are therefore not considered potential ARARs for the site.

A3.2.2 Wetlands Protection and Floodplains Management ARARs

Pertinent and substantive provisions of the following federal and state laws and regulations were reviewed to determine whether they would be potential location-specific ARARs for remedial action at IRP Site 5:

- Executive Order Number (Exec. Order No.) 11990, Protection of Wetlands (40 C.F.R. § 6.302[a])
- Exec. Order No. 11988, Floodplain Management (40 C.F.R. § 6.302[b])
- CWA Section 404 (33 U.S.C. § 1344)
- RCRA (42 U.S.C. §§ 6901–6991[i]) and Cal. Code Regs. tit. 22, § 66264.18(b)
- Fish & Game Commission Wetlands Policy (adopted 1987, in Cal. Fish & Game Code Addenda)

Federal requirements for the protection of wetlands in Exec. Order No. 11990 and CWA Section 404 are potentially applicable or relevant and appropriate because of the proximity of IRP Site 5 to wetlands around Mugu Lagoon. No state requirements were identified as potential ARARs.

NBVC Point Mugu is not included in an area covered by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for Ventura County, California (FEMA 1985). Given the coastal location of the site, it is not considered to be within the 100-year floodplain of Calleguas Creek.

A3.2.2.1 FEDERAL

Federal requirements evaluated as potential ARARs for wetlands protection are discussed in the subsections below.

Protection of Wetlands, Exec. Order No. 11990

Exec. Order No. 11990 requires that federal agencies minimize the destruction, loss, or degradation of wetlands; preserve and enhance the natural and beneficial value of wetlands; and avoid support of new construction in wetlands if a practicable alternative exists.

Wetlands constitute approximately 2,500 acres of NBVC Point Mugu, approximately 56 percent of the total 4,490 acres of the facility. IRP Site 5 is located adjacent to Mugu Lagoon, and the northern portion of the site is largely occupied by associated salt marsh wetlands around the lagoon; therefore, federal requirements to protect wetlands have been identified as potential ARARs for site management. Therefore, substantive provisions of 40 C.F.R. § 6.302 (a) are potential ARARs for response actions at IRP Site 5. Measures would be taken to prevent or mitigate potential impacts to wetlands.

Floodplain Management, Exec. Order No. 11988

Under 40 C.F.R. § 6.302(b), federal agencies are required to evaluate the potential effects of action they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain.

NBVC Point Mugu is not included in an area covered by the FEMA Flood Insurance Rate Map for Ventura County, California (FEMA 1985). Since IRP Site 5 is located along the coast with ready drainage to the ocean or Mugu Lagoon, it is not anticipated that the site is within the 100-year floodplain of Calleguas Creek; however, it may be subject to ocean storm surge. The proposed removal actions for IRP Site 5 do not involve further development of the site, but do involve removal and/or treatment of impacted sediment. Based on this information, floodplain requirements of Exec. Order No. 11988 and 40 C.F.R. § 6.302(b), are not considered potential ARARs for removal actions at IRP Site 5.

Clean Water Act (33 U.S.C. § 1344)

Section 404 of the CWA of 1977 governs the discharge of dredged and fill material into waters of the United States, including adjacent wetlands. Wetlands are areas that are inundated by water frequently enough to support vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mudflats, natural ponds, and similar areas. Both U.S. EPA and USACE have jurisdiction over wetlands. U.S. EPA's Section 404 guidelines are promulgated in 40 C.F.R. pt. 230, and the USACE's guidelines are promulgated in 33 C.F.R. pt. 320.

IRP Site 5 is located adjacent to Mugu Lagoon and the northern portion of the site is largely occupied by associated salt marsh habitat. For this reason, Section 404 of the CWA of 1977 (33 U.S.C. § 1344) has been determined to be potentially relevant and appropriate for this removal action. These requirements will be complied with by following the guidelines of 40 C.F.R. pt. 230 and 33 C.F.R. pt. 320.

Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])

Under Cal. Code Regs. tit. 22, § 66264.18(b), any hazardous waste facility located in a 100-year floodplain or within the maximum high tide zone must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood or maximum high tide, unless the owner or operator can demonstrate that procedures are in effect that will cause the waste to be removed safely, before flood or tidewater can reach the facility.

Since IRP Site 5 is located along the coast with ready drainage to the ocean or Mugu Lagoon, it is not anticipated that the site is within the 100-year floodplain of Calleguas Creek; however, it may be subject to ocean storm surge. Based on this information, floodplain requirements of RCRA are not considered potential ARARs for IRP Site 5.

A3.2.3 Hydrologic Resources ARARs

Pertinent and substantive provisions of the following laws and regulations were reviewed to determine whether they would be potential location-specific ARARs for IRP Site 5 removal actions:

- Wild and Scenic Rivers Act (substantive provisions of 16 U.S.C. §§ 1271–1287)
- Fish and Wildlife Coordination Act (substantive provisions of 16 U.S.C. §§ 661–666c)
- Rivers and Harbors Act of 1899 (substantive provisions of 33 U.S.C. §§ 401–413)

No potential state requirements were identified for hydrologic resources.

A3.2.3.1 WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act (WSRA) (16 U.S.C. §§ 1271–1287) establishes requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System, as well as rivers designated on the National Rivers Inventory to be studied for inclusion on the national system. In accordance with Section 7 of the act, a federal agency may not assist, through grant, loan, license, or otherwise, the construction of a water resources project that would have a direct and adverse effect on the free-flowing, scenic, and natural values for which a river on the national system or a study river on the National Rivers Inventory was established. The act also covers indirect effects from construction of water resources projects below or above rivers or their tributaries that are in the national system or under study on the National Rivers Inventory, such as a dam on a tributary and construction or development on adjacent shorelines. Adverse impacts must be mitigated, and coordination may be required with the National Park Service and Department of Agriculture.

No wild, scenic, or recreational rivers are at or in the vicinity of IRP Site 5. Calleguas Creek enters the eastern portion of Mugu Lagoon more than 1.5 miles east of IRP Site 5. The proposed removal action is not anticipated to have an adverse effect on the scenic beauty or other potential beneficial uses of Calleguas Creek, and therefore, requirements in 16 U.S.C. §§ 1271–1287 are not potential ARARs for IRP Site 5.

A3.2.3.2 FISH AND WILDLIFE COORDINATION ACT

The Fish and Wildlife Coordination Act (16 U.S.C. §§ 661–666c) was enacted to protect fish and wildlife when federal actions result in the control or structural modification of a natural stream or body of water. The statute requires federal agencies to take into consideration the effect a water-related project would have on fish and wildlife and take action to prevent loss or damage to these resources.

Removal actions are not anticipated to modify a stream or other water body at NBVC Point Mugu, and therefore, the requirements in 16 U.S.C. §§ 661–666c are not potential ARARs for IRP Site 5.

A3.2.3.3 RIVERS AND HARBORS ACT OF 1899

Section 10 of the Rivers and Harbors Act of 1899 prohibits the creation of any obstruction not authorized by Congress to the navigable capacity of any of the waters of the United States (33 U.S.C. §§ 401–413). It prohibits construction of wharves, piers, booms, weirs, breakwaters, bulkheads, jetties, or other structures in a port unless the construction is approved by the USACE. In addition, excavation or filling of any port, harbor, channel, lake, or any navigable water is prohibited without authorization. Section 10 permits are required for these activities. Section 10 permits cover construction, excavation, or deposition of materials in, over, or under navigable waters, or any work that would affect the course, location, condition, or capacity of those waters.

Although IRP Site 5 is in the vicinity of navigable waters, the proposed removal action does not include or anticipate the need for activities that have the potential to impact said waters. The requirements in 33 U.S.C. §§ 401–413 are not potential ARARs for IRP Site 5.

A3.2.4 Biological Resources ARARs

Pertinent and substantive provisions of the following federal and state laws and regulations were reviewed to determine whether they would be potential location-specific ARARs for removal actions at IRP Site 5:

- ESA of 1973 (substantive provisions of 16 U.S.C. §§ 1531–1543)
- MBTA of 1972 (substantive provisions of 16 U.S.C. §§ 703–712)
- Marine Mammal Protection Act (substantive provisions of 16 U.S.C. §§ 1361–1421h)
- Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801–1882)
- National Wildlife Refuge System Administration Act of 1996 (16 U.S.C. § 668dd–668ee and substantive provisions of 50 C.F.R. § 27.11–27.97)
- Wilderness Act (16 U.S.C. §§ 1131–1136 and 50 C.F.R. § 35.1–35.14)
- CZMA
- California ESA (Cal. Fish & Game Code, ch. 1.5, §§ 2050–2116)
- Cal. Fish & Game Code, ch. 1.5, §§ 711.7, 1600, 1700, 1750, 1801, 1908, 2014, 3005, 3503.5, 3511, 3513, 3800, 4000, 4150, 4700, 5050, 5515, and 8500
- Cal. Code Regs. regarding natural resources (Cal. Code Regs. tit. 14, div. 1, Subdivision 1, ch. 5, §§ 40 and 460)
- California Coastal Act of 1976

Substantive requirements of the federal and California ESAs, CZMA, and the California Coastal Act were found to be potential ARARs for the removal action proposed for IRP Site 5 and are discussed in detail below.

A3.2.4.1 FEDERAL

Federal requirements evaluated as potential ARARs for biological resources are discussed in the subsections below.

Endangered Species Act of 1973

The Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531–1543) provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction. The ESA defines an endangered species and provides for the designation of critical habitats. Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. Under Section 7(a) of the ESA (16 U.S.C. § 1536[a][2]), federal agencies must carry out conservation programs for listed species. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and

habitat acquisition and improvement are implemented (16 U.S.C. § 1536[h][1][B]). Consultation regulations at 50 C.F.R. pt. 402 are administrative in nature and are therefore not ARARs. However, they may be TBCs to comply with the substantive provisions of the ESA.

Table A3-1 lists federal requirements for the protection of threatened and endangered species that are potential ARARs for CERCLA actions at IRP Site 5. The rare, threatened, and endangered species and species of special concern are reported in Section 2 of the EE/CA report for IRP Site 5.

Migratory Bird Treaty Act of 1972

The Migratory Bird Treaty Act (16 U.S.C. §§ 703–712) prohibits at any time, using any means or manner, the pursuit, hunting, capturing, and killing or attempting to take, capture, or kill any migratory bird. This act also prohibits the possession, sale, export, and import of any migratory bird or any part of a migratory bird, as well as nests and eggs. A list of migratory birds for which this requirement applies is found at 50 C.F.R. § 10.13. It is the DON's position that this act is not legally applicable to DON actions; however, Exec. Order No. 13186 (dated 10 January 2001) requires each federal agency taking actions that have or are likely to have a measurable effect on migratory bird populations to develop and implement, within 2 years, a memorandum of understanding (MOU) with the USFWS to promote the conservation of such populations. The DoD and USFWS are in the process of negotiating this MOU. In the meantime, the Migratory Bird Treaty Act will continue to be evaluated as a potentially relevant and appropriate requirement for DON CERCLA response actions.

Migratory birds have not been reported actively using IRP Site 5, but several species are documented to visit NBVC Point Mugu, specifically Mugu Lagoon, which is an integral part of the Pacific Flyway. Approximately 20 species of migratory bird typically occur in the salt marsh habitat alone and have the potential to occur in the vicinity of Mugu Lagoon and IRP Site 5. Therefore, the substantive requirements of the MBTA are considered relevant and appropriate for IRP Site 5 removal actions. Surveillance and scheduling would be used to determine the best time for removal activities; seasons when migratory birds commonly frequent Mugu Lagoon and adjacent salt marshes would be avoided to the extent practicable. Communication and coordination with state and local wildlife agencies would be important during both the design and the implementation of the selected removal action.

Marine Mammal Protection Act

The Marine Mammal Protection Act (16 U.S.C. §§ 1361–1421h) prohibits the taking of a marine mammal on the high seas or in a harbor or other place under the jurisdiction of the United States. It prohibits the possession, transport, and sale of a mammal or marine mammal product, unless authorized under law. The prohibitions that are potentially pertinent to CERCLA actions are at 16 U.S.C. § 1372(a)(2).

The harbor seal is the only special-status marine mammal identified in an ecological survey conducted for NBVC Point Mugu. The harbor seal is reported to come ashore at several locations at Mugu Lagoon. Intertidal mudflats within Mugu Lagoon's central basin are used for resting, molting, and breeding (TtEMI 2002). IRP Site 5 is located approximately 5,000 feet west of this location. Proposed removal actions are not considered to have the potential to disturb habitat used by the harbor seal. The potential for sediment COCs to migrate off-site at concentrations exceeding applicable regulatory criteria is limited and would be further minimized by removal actions. Therefore, the substantive requirements of the Marine Mammal Protection Act are not considered potential ARARs for IRP Site 5 removal actions.

Magnuson-Stevens Fishery Conservation and Management Act of 1976, as Amended

The purpose of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801–1882) is to conserve and manage the fishery resources found off the coasts of the United States, the

anadromous species, and the continental shelf fishery resources of the United States. It establishes a fishery conservation zone within which the United States has exclusive fishery management prerogatives.

According to the IAS (SCS and Landau Assoc. 1985), IRP Site 5 is not located within 0.5 mile of a designated fishery conservation zone; therefore, requirements of the act are not considered potential ARARs.

National Wildlife Refuge System Administration Act of 1966

The NWR System Administration Act of 1966 (16 U.S.C. § 668dd–668ee) and its implementing regulations at 50 C.F.R. pts. 25–37 establish wildlife refuges that are maintained for the primary purpose of developing a national program of wildlife and ecological conservation and rehabilitation. These refuges are established for the restoration, preservation, development, and management of wildlife and wild land habitats; protection and preservation of endangered or threatened species and their habitats; and management of wildlife and wild lands to obtain the maximum benefit from these resources.

The NWR System Administration Act contains the following substantive requirements that are potential ARARs. The act prohibits any person from disturbing, injuring, cutting, burning, removing, destroying, or possessing any property within any area of a wildlife refuge. The act also prohibits the taking or possessing of any fish, bird, mammal, or other wild vertebrate or invertebrate animals or nest or eggs within any refuge area or otherwise occupying any such area unless such activities are done with a permit or permitted by express provision of law. The act also regulates the use of audio equipment as well as motorized vehicles, aircraft, and boats in wildlife refuges. It prohibits construction activities, disposal of waste, and the introduction of plants and animals into any wildlife refuge. The prohibitions under the act are codified at 50 C.F.R. pt. 27.

Private game preserves (duck ponds) are located within 7,500 feet and 9,000 feet northwest of IRP Site 5. The boundaries of the Point Mugu State Park recreational area extends from Calleguas Creek west to within approximately 1,200 feet east of the site. However, IRP Site 5 and NBVC Point Mugu, in general, are not identified as part or in the vicinity of a designated National Wildlife Refuge; therefore, the requirements and prohibitions of the National Wildlife Refuge System Administration Act are not identified as potential ARARs for proposed removal actions at IRP Site 5.

Wilderness Act

The Wilderness Act (16 U.S.C. § 1131) and its accompanying implementing regulations (50 C.F.R. § 35.1–35.14) create the National Wilderness Preservation System. The intent of the law is to administer and manage units of this system (i.e., wilderness areas) in order to preserve their wilderness character and to leave them unimpaired for future use as wilderness.

NBVC Point Mugu is not part of a federally owned or designated wilderness area. Therefore, the requirements of the Wilderness Act are not identified as potential ARARs for proposed removal actions.

A3.2.4.2 STATE

General sections of the *California Fish and Game Code* (Cal. Fish & Game Code) were evaluated for potential ARARs. Requirements of some sections of the California ESA were identified as potential ARARs.

California Endangered Species Act

The California Endangered Species Act (ESA) is codified in the Cal. Fish & Game Code §§ 2050–2116. It is the DON's position that the requisite federal sovereign immunity waiver does not exist to authorize applicability of the California ESA. Nevertheless, this act will be evaluated as a potentially relevant and

appropriate requirement for the DON's CERCLA response actions. Cal. Fish & Game Code § 2080 prohibits the take of endangered species.

Provisions of the California ESA are set forth in the Cal. Fish & Game Code §§ 2050–2068, 2070, 2080, and 2090–2096. Of these, §§ 2050–2068 and 2070 have been determined not to represent “cleanup standard, standard of control,” or “other substantive requirement, criteria, or limitation” (CERCLA Section 121, 42 U.S.C. § 9621). The requirements of §§ 2090–2096 were not effective after 01 January 1994.

Cal. Fish & Game Code § 2080 states that no person shall import, export, take, possess, or sell any endangered or threatened species or part or product thereof. The light-footed clapper rail is a state endangered species and is reported to nest near IRP Site 5. This species is also a listed federal endangered species. The Cal. Fish & Game Code § 2080 requirements are not considered potential ARARs for the light-footed clapper rail since they are not more stringent than the federal ARARs identified for the same species at the site. Belding's savannah sparrow, a state endangered bird, is a common year-round resident of Mugu Lagoon (TtEMI 2002). The peregrine falcon, a state endangered bird, forages at NBVC Point Mugu (TtEMI 2002). The Belding's savannah sparrow and the peregrine falcon have not been noted using IRP Site 5 habitats, and the nature of the removal action is not considered likely to endanger individuals of the species who may be temporary visitors of the site, and not nesting there. Since these species are not protected by the federal ESA, substantive provisions of Cal. Fish & Game Code § 2080 may be potentially relevant and appropriate if the response action could “take” these species. In order to be a relevant and appropriate, the purpose of the requirement and the purpose of the CERCLA action need to match. The purpose of the requirement is to prohibit a take defined as to “hunt, pursue, catch, capture, or kill” or attempt to do so. The purpose of the CERCLA action does not include any of the prohibited actions. However, the DON has decided to include Cal. Fish & Game Code § 2080 as a potentially relevant and appropriate requirement and plans to comply by implementing one of the removal action alternatives that were developed to manage the potential ecological risk at the site. The Navy biologists at NBVC will be consulted prior to removal action.

Other California Fish & Game Code and Cal. Code of Regulations, Title 14 Requirements

The state identified several sections of the Cal. Fish & Game Code not included in the California ESA (§§ 2050–2116) and sections of Cal. Code Regs. tit. 14, as potential location-specific ARARs for the removal action proposed at IRP site 5. The sections provide requirements for the protection of species groups and/or their habitats (see Table B3-2).

A3.2.5 Coastal Resources ARARs

Pertinent and substantive provisions of the following federal and state laws and regulations were reviewed to determine whether they would be potential location-specific ARARs for IRP Site 5 removal actions:

- CZMA (substantive provisions of 16 U.S.C. §§ 1451–1464 and 15 C.F.R. pt. 930)
- California Coastal Act of 1976 (*California Public Resources Code* [Cal. Pub. Res. Code] §§ 30000–30900; Cal. Code Regs. tit. 14, §§ 13001–13666.4)

IRP Site 5 is on a stabilized sand bar between Mugu Lagoon and the Pacific Ocean. Although not applicable to federal lands, requirements of the CZMA and California Coastal Act are potentially relevant and appropriate to removal actions taken at IRP Site 5.

A3.2.5.1 FEDERAL

Federal requirements evaluated as potential ARARs for coastal resources are discussed in the subsections below.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (16 U.S.C. §§ 1451–1464) specifically excludes federal lands from the coastal zone (16 U.S.C. § 1453[1]). Therefore, the CZMA is not potentially applicable to IRP Site 5. The CZMA will be evaluated as a potentially relevant and appropriate requirement. Section 1456(c)(1)(A) requires each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource to conduct its activities in a manner that is consistent to the maximum extent practicable with enforceable policies of approved state management policies. A state coastal zone management program is developed under state law guided by the CZMA and its accompanying implementing regulations in 15 C.F.R. pt. 930. A state program sets forth objectives, policies, and standards to guide public and private uses of lands and water in the coastal zone. See Section A3.2.5.2 for the state coastal zone management program.

IRP Site 5 is on a stabilized sand bar between Mugu Lagoon and the Pacific Ocean. Removal actions taken at IRP Site 5 would be conducted in a manner that is consistent with the approved state coastal zone management programs.

A3.2.5.2 STATE

State requirements evaluated as potential ARARs for coastal resources are discussed in the subsections below.

California Coastal Act of 1976

The California Coastal Act is codified at Public Resources Code (Cal. Pub. Res. Code) §§ 30000–30900 and Cal. Code Regs. tit. 14, §§ 13001–13666.4. These sections regulate activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources. Since federal lands are specifically excluded from the definition of coastal zone, the California Coastal Act is not potentially applicable to IRP Site 5, but is evaluated further as a potentially relevant and appropriate requirement. The California Coastal Act policies set forth in the act constitute the standards used by the California Coastal Commission in its coastal development permit decisions and for the review of local coastal programs. These policies contain the following substantive requirements: protection and expansion of public access to the shoreline and recreation opportunities (Cal. Pub. Res. Code §§ 30210–30224); protection, enhancement, and restoration of environmentally sensitive habitats including intertidal and nearshore waters, wetlands, bays and estuaries, riparian habitat, grasslands, streams, lakes, and habitat for rare or endangered plants or animals (Cal. Pub. Res. Code §§ 30230–30240); protection of productive agricultural lands, commercial fisheries, and archaeological resources (Cal. Pub. Res. Code §§ 30234, 30241–30244); protection of the scenic beauty of coastal landscapes (Cal. Pub. Res. Code § 30251); and provisions for expansion, in an environmentally sound manner, of existing industrial ports and electricity-generating power plants (Cal. Pub. Res. Code § 30264).

The removal actions taken at the site would be conducted in a manner that is consistent with the approved state coastal zone management program. The specific requirement of the California Coastal Act considered to be a potential ARAR for the removal action at IRP Site 5 is the protection, enhancement, and restoration of environmentally sensitive habitats including nearshore waters, wetlands, bays and estuaries, grasslands, and habitat for rare or endangered plants or animals (Cal. Pub. Res. Code §§ 30230–30240). The removal alternatives proposed for sediment at IRP Site 5 would ultimately improve the usefulness of the site and be protective of the coastal resources of NBVC Point Mugu.

A3.2.6 Geologic Characteristics ARARs

IRP Site 5 is not located within 61 meters of a Holocene fault and no discharge is proposed to a salt dome formation, salt bed formation, or underground mines or caves. Therefore, no location-specific ARARs pertaining to geologic characteristics have been identified for IRP Site 5.

**Table A3-1
Potential Federal Location-Specific ARARs**

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Historic Preservation Act of 1966, as Amended (16 U.S.C. § 470–470x-6)^b | | | | | |
| Historic project owned or controlled by federal agency | Action to preserve historic properties; planning of action to minimize harm to properties listed on or eligible for listing on the National Register of Historic Places. | Property included in or eligible for the National Register of Historic Places. | 16 U.S.C. § 470–470x-6 36 C.F.R. pt. 800 40 C.F.R. § 6.301(b) | Not an ARAR | Historic properties at NBVC Point Mugu including properties listed on or eligible for listing on the National Register of Historic Places are not located on or in the vicinity of IRP Site 5. |
| Archaeological and Historic Preservation Act (16 U.S.C. § 469–469c-1)^b | | | | | |
| Within area where action may cause irreparable harm, loss, or destruction of significant artifacts | Construction on previously undisturbed land would require an archaeological survey of the area. Data recovery and preservation would be required if significant archaeological or historical data were found on-site. The responsible official or Secretary of the Interior is authorized to undertake data recovery and preservation. | Regulated alteration of terrain caused as a result of a federal construction project or federally licensed activity or program where action may cause irreparable harm, loss, or destruction of significant artifacts. | 16 U.S.C. § 469–469c-1 40 C.F.R. § 6.301(c) | Not an ARAR | Archaeological or historical resources identified for NBVC Point Mugu are not known to exist on or in the vicinity of IRP Site 5. |

Table A3-1 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Historic Sites, Buildings, and Antiquities Act of 1935 (16 U.S.C. §§ 461–467)^b | | | | | |
| Historic sites | Avoid undesirable impacts on landmarks. | Areas designated as historic sites. | 16 U.S.C. §§ 461–467 40 C.F.R. § 6.301(a) | Not an ARAR | Historic properties at NBVC Point Mugu are not located on or in the vicinity of IRP Site 5. |
| Archaeological Resources Protection Act of 1979, as Amended (16 U.S.C. § 470aa–470mm)^b | | | | | |
| Archaeological resources on federal land | Prohibits unauthorized excavation, removal, damage, alteration, or defacement of archaeological resources located on public lands unless such action is conducted pursuant to a permit. | Archaeological resources on federal land. | Pub. L. No. 96-95 16 U.S.C. § 470aa–470mm | Not an ARAR | Archaeological or historical resources identified for NBVC Point Mugu are not known to exist on or in the vicinity of IRP Site 5. |
| Exec. Order No. 11990, Protection of Wetlands^b | | | | | |
| Wetland | Avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and avoid support of new construction in wetlands if practicable alternatives exist. | Wetland meeting definition of Section 7. | 40 C.F.R. § 6.302(a) and 40 C.F.R. pt. 6, app. A, § 6(a)(1), (3), and (5) (at the end of § 6.1007) | Relevant and Appropriate | Wetlands at NBVC Point Mugu are located around Mugu Lagoon and include saltmarsh habitat in the northern part of IRP Site 5. Measures would be taken to prevent or mitigate potential impacts to wetlands. |
| Exec. Order No. 11988, Floodplain Management^b | | | | | |

Table A3-1 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Within floodplain | Evaluate potential effects of actions in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain. | Action that will occur in a floodplain (i.e., lowlands) and relatively flat areas adjoining inland and coastal waters and other flood-prone areas. | 40 C.F.R. § 6.302(b) and 40 C.F.R. pt. 6, app. A, § 6(a)(1), (3), and (5) (at the end of § 6.1007) | Not an ARAR | IRP Site 5 consists of man-made land and wetlands on the coast and is not considered to be within the estimated 100-year floodplain. |
| Clean Water Act of 1977, as Amended, Section 404 (33 U.S.C. § 1344)^b | | | | | |
| Wetland | Action to prohibit discharge of dredged or fill material into wetland without permit. | Wetland as defined by Exec. Order No. 11990 Section 7. | 33 U.S.C. § 1344 | Relevant and Appropriate | CERCLA actions are not subject to permit requirements under Section 121(e) of CERCLA (42 U.S.C. ch. 103 § 9621[e][1]). However, the substantive provisions of this regulation are relevant and appropriate since removal activities proposed may include backfilling of excavated areas potentially within wetland area of the site. |
| Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])^b | | | | | |
| Within 100-year floodplain | Facility must be designed, constructed, operated, and maintained to avoid washout. | RCRA hazardous waste; treatment, storage, or disposal of hazardous waste. | Cal. Code Regs. tit. 22, § 66264.18(b) | Not an ARAR | IRP Site 5 consists of man-made land and wetlands on the coast and is not considered to be within the estimated 100-year floodplain. |
| Wild and Scenic Rivers Act (16 U.S.C. §§ 1271–1287)^b | | | | | |

Table A3-1 (continued)

| Location | Requirement | Prerequisite | Citation^a | ARAR Determination | Comments |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Within area affecting national wild, scenic, or recreational river | Avoid taking or assisting in action that will have direct adverse effect on scenic river. | Activities that affect or may affect any of the rivers specified in 16 U.S.C. §1276(a). | 16 U.S.C. §§ 1271–1287 | Not an ARAR | No wild, scenic or recreational rivers are located at or in the vicinity of IRP Site 5. Therefore, the requirements of 16 U.S.C. §§ 1271–1287 do not constitute ARARs for the removal action at IRP Site 5. |
| Fish and Wildlife Coordination Act (16 U.S.C. §§ 661–666c)^b | | | | | |
| Area affecting stream or other water body | Action taken should protect fish or wildlife. | Diversion, channeling, or other activity that modifies a stream or other water body and affects fish or wildlife. | 16 U.S.C. § 662 | Not an ARAR | Proposed removal activities at IRP Site 5 do not include physical modification of the lagoon. |
| Rivers and Harbors Act of 1899 (33 U.S.C. §§ 401–413)^b | | | | | |
| Navigable waters | Permits required for structures or work in or affecting navigable waters. | Activities affecting navigable waters. | 33 U.S.C. § 403 33 C.F.R. § 322 | Not an ARAR | IRP Site 5 is located adjacent to Mugu Lagoon, designated a navigable waterway. However, proposed removal actions would not modify this water body. |
| Endangered Species Act of 1973 (16 U.S.C. §§ 1531–1543)^b | | | | | |

Table A3-1 (continued)

| Location | Requirement | Prerequisite | Citation^a | ARAR Determination | Comments |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Habitat upon which endangered species or threatened species depend | Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat. The Endangered Species Committee may grant an exemption for agency action if reasonable mitigation and enhancement measures such as propagation, transplantation, and habitat acquisition and improvement are implemented. | Determination of effect upon endangered or threatened species or its habitat. Critical habitat upon which endangered species or threatened species depend | 16 U.S.C. § 1536(a), (h)(1)(B) | Applicable | The light-footed clapper rail (endangered bird) has been observed at IRP Site 5. Removal activities would be conducted in a manner protective of wildlife species, including endangered or threatened species. Surveillance and scheduling of removal activities that could disturb breeding would be used to minimize potential adverse effects. |
| Migratory Bird Treaty Act of 1972 (16 U.S.C. §§ 703–712)^b | | | | | |
| Migratory bird area | Protects almost all species of native migratory birds in the U.S. from unregulated “take,” which can include poisoning at hazardous waste sites. | Presence of migratory birds. | 16 U.S.C. § 703 | Relevant and Appropriate | Migratory birds have not been identified as specifically using IRP Site 5, but several species have been documented as visiting Mugu Lagoon, and may visit IRP Site 5. Removal activities would be conducted in a manner protective of wildlife species, including migratory birds. Surveillance and scheduling of removal activities that could disturb seasonal use would be employed to minimize potential adverse effects. |
| Marine Mammal Protection Act (16 U.S.C. §§ 1361–1421h)^b | | | | | |

Table A3-1 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Marine mammal area | Protects any marine mammal in the U.S. except as provided by international treaties from unregulated “take.” | Presence of marine mammals. | 16 U.S.C. § 1372(a)(2) | Not an ARAR | Marine mammals have not been reported at IRP Site 5 and are not expected to be potentially affected by removal alternatives. |
| Magnuson-Stevens Fishery Conservation and Management Act of 1976, as Amended (16 U.S.C. §§ 1801–1882)^b | | | | | |
| Fishery under management | Provides for conservation and management of specified fisheries within specified fishery conservation zones | Presence of managed fisheries. | 16 U.S.C. §§ 1801–1882 | Not an ARAR | IRP Site 5 is not near areas of managed fisheries and none are located in Mugu Lagoon. |
| National Wildlife Refuge System Administration Act of 1996 (16 U.S.C. § 668dd–668ee)^b | | | | | |
| Wildlife refuge | No person shall take any animal or plant on any national wildlife refuge, except as authorized under 50 C.F.R. § 27.51. The disposing or dumping of wastes is prohibited. | Area designated as part of National Wildlife Refuge System. | 16 U.S.C. § 668dd–668ee Substantive provisions of 50 C.F.R. § 27.11–27.97 | Not an ARAR | IRP Site 5 is not designated as part of the National Wildlife Refuge System and therefore, this is not a potential ARAR for the response action at this site. |
| Wilderness Act (16 U.S.C. §§ 1131–1136)^b | | | | | |
| Wilderness area | Area must be administered in such a manner as will leave it unimpaired as wilderness and preserve its wilderness character. | Federally owned area designated as wilderness area. | 16 U.S.C. §§ 1131–1136 50 C.F.R. §§ 35.1–35.14 | Not an ARAR | There are no federally owned wilderness areas at or within the IRP Site 5 and therefore, this requirement is not a potential ARAR. |
| Coastal Zone Management Act (16 U.S.C. §§ 1451–1464)^b | | | | | |

Table A3-1 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Within coastal zone | Conduct activities in a manner consistent with approved state management programs. | Activities affecting the coastal zone including lands thereunder and adjacent shore land. | 16 U.S.C. § 1456(c) 15 C.F.R. § 930 | Relevant and Appropriate | Not applicable because the CZMA specifically excludes federal lands from the coastal zone. However, the substantive provisions are relevant and appropriate, since IRP Site 5 is located on a sand bar between Mugu Lagoon and the Pacific Ocean. |
| Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])^b | | | | | |
| Within 61 meters (200 feet) of a fault displaced in Holocene time | New treatment, storage, or disposal of hazardous waste prohibited. | RCRA hazardous waste; treatment, storage, or disposal of hazardous waste. | Cal. Code Regs. tit. 22, § 66264.18(a) | Not an ARAR | IRP Site 5 is not located within 200 feet of a fault exhibiting Holocene movement. |
| Within salt dome formation, underground mine, or cave | Placement of noncontainerized or bulk liquid hazardous waste prohibited. | RCRA hazardous waste; placement. | Cal. Code Regs. tit. 22, § 66264.18(c) | Not an ARAR | Salt domes, mines, or caves are not located on NBVC Point Mugu. |

Notes:

^a only the substantive provisions of the requirements cited in this table are potential ARARs

^b statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific citations are considered potential ARARs

Acronyms/Abbreviations:

app. – appendix

ARAR – applicable or relevant and appropriate requirement

Cal. Code Regs. – *California Code of Regulations*

C.F.R. – *Code of Federal Regulations*

Exec. Order No. – executive order number
pt. – part
RCRA – Resource Conservation and Recovery Act
§ – section
tit. – title
U.S. – United States
U.S.C. – United States Code

Table A3-2
Potential State Location-Specific ARARs

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wetlands | Actions must be taken to assure that there is no net loss of wetlands acreage or habitat value. Action must be taken to preserve, protect, restore, and enhance California's wetland acreage and habitat values. | | Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Agenda | Not an ARAR; potential TBC | <p>The Fish and Game Commission wetland policy does not constitute potential ARAR for the response action at IRP Site 5. In order for a state requirement to qualify as applicable or relevant and appropriate requirement (ARAR) under CERCLA, the requirement must be a state law or regulation and must be promulgated (of general applicability and legally enforceable). California Fish and Game Commission wetland policy is not a promulgated regulatory requirement; therefore, it does not constitute a potential ARAR for the response action at IRP Site 5. This is confirmed by the following Fish and Game Commission comment relating to the scope of the wetland policy (CFGF 1994):</p> <p><i>"The Commission has found the policy and implementation procedures to be nonregulatory in nature. Their intended application is in those circumstances where the Department's role is advisory, as in, but not limited to, the application of the California Environmental Quality Act, National Environmental Protection Act, California Coastal Act, Clean Water Act, and other applicable state and federal laws and regulations."</i></p> |

Table A3-2 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Endangered species habitat | Department policy and legislative findings and definitions for significant natural areas. | Activity taking place in an endangered species habitat and significant natural area. | Cal. Fish & Game Code §§ 2050–2068 | Not an ARAR | Procedural; not a “cleanup standard, standard of control,” or “other substantive requirement, criteria, or limitation.” |
| | Procedures for listing endangered species. | Threatened or endangered species determination. | Cal. Fish & Game Code § 2070-2079 | Not an ARAR | Procedural; not a “cleanup standard, standard of control,” or “other substantive requirement, criteria, or limitation.” |
| | No person shall import, export, take, possess, or sell any endangered or threatened species or part or product thereof. | Threatened or endangered species determination on or before 01 January 1985 or a candidate species with proper notification. | Cal. Fish & Game Code § 2080 | Relevant and Appropriate | Belding’s savannah sparrow, a state endangered bird, is a common year-round resident of Mugu Lagoon (TtEMI 2002). The peregrine falcon, a state endangered bird, forages at NBVC Point Mugu (TtEMI 2002). Therefore, the Cal. Fish & Game Code § 2080 requirements are considered potential ARARs for IRP Site 5 identified for the same species at the site. The Navy biologists at NBVC will be consulted prior to removal action. |
| Actions involving wildlife | Designation of the Department of Fish and Game as trustee for State Fish and Wildlife Resources. | | Cal. Fish & Game Code § 711.7 | Not an ARAR | Not a “cleanup standard, standard of control,” or “other substantive requirement, criteria, or limitation.” |

Table A3-2 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Species protection | Action must be taken to prevent the take of rare or endangered native plants. | Rare or endangered native plants | Cal. Fish & Game Code § 1908 | Not an ARAR | One native plant species, the salt marsh bird's beak, is known to occur in tidal marsh habitat around Mugu Lagoon. However, Navy biologists perform annual mapping of salt marsh bird's beak habitat at NBVC Point Mugu and according to the 2007 survey, salt marsh bird's beak habitat does not exist at or near IRP Site 5. Therefore, this is not a potential ARAR. The most recent survey will be consulted prior to removal action. |
| Actions impacting birds or mammals | Prohibits the taking of birds and mammals, including the taking by poison. | Birds and mammals | Cal. Fish & Game Code § 3005 | Relevant and Appropriate | Substantive requirements are potential ARARs if birds and mammals are identified at IRP Site 5 under Alternatives 2 and 3. Measures will be taken to avoid the take of these animals. |
| Actions impacting birds | Prohibits take, possession, or needless destruction of the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. | | Cal. Fish and Game Code § 3503.5 | Relevant and Appropriate | The American peregrine falcon is known to visit habitats of Mugu Lagoon in winter. However, predatory birds are not known to nest at IRP Site 5 and the Mugu Lagoon habitat is not considered a significant one for the species. Regardless, substantive provisions of this regulation have been identified as potentially relevant and appropriate and measures will be taken to avoid the take of birds or needless destruction of the nest or eggs during removal action implementation. The Navy biologists at NBVC will be consulted prior to removal action. |

Table A3-2 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Actions impacting fully protected birds. | Prohibits take or possession of any of the following fully protected birds: 1) American peregrine falcon (2) Brown pelican (3) California black rail (4) California clapper rail (5) California condor (6) California least tern (7) Golden eagle (8) Greater sandhill crane (9) Light-footed clapper rail (10) Southern bald eagle (11) Trumpeter swan (12) White-tailed kite (13) Yuma clapper rail. | | Cal. Fish & Game Code § 3511 | Not an ARAR | Four birds designated as fully protected birds, the California brown pelican, light-footed clapper rail, the California least tern, and the peregrine falcon are known to occupy habitats of the Mugu Lagoon. The California brown pelican, light-footed clapper rail, and the California least tern, are also federal endangered species and the peregrine falcon is a state endangered species. Of these birds only the light-footed clapper rail has been reported at IRP Site 5. Substantive provisions are potentially relevant and appropriate for the peregrine falcon, which is not protected under the federal ESA. Substantive requirements are not more stringent than federal ESA requirements determined to be federal ARARs for the California brown pelican, light-footed clapper rail, and California least tern except for incidental take. Therefore, substantive provisions of Cal. Fish & Game Code § 3511 are considered relevant and appropriate for the peregrine falcon and for the other species for prohibiting incidental take. The removal action will be conducted in a manner that will not include hunting, pursuing, catching, capturing, or killing the peregrine falcon and will not include incidental take of any of the fully protected birds. The Navy biologists at NBVC will be consulted prior to removal action. |

Table A3-2 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Species protection | Action must be taken to prevent take of migratory nongame birds (as designated in the Migratory Bird Treaty Act). | Migratory nongame birds | Cal. Fish & Game Code § 3513 | Not an ARAR | Several migratory birds are known to visit Mugu Lagoon, and may visit salt marsh habitat at IRP Site 5. However, substantive requirements are not broader in scope or more stringent than the federal Endangered Species Act of 1972 identified as a potential ARAR. |
| Actions impacting nongame birds | Prohibits the take of nongame birds, except in accordance with regulations of the commission, or when related to mining operations with a mitigation plan approved by the California Department of Fish and Game. | | Cal. Fish & Game Code § 3800 | Relevant and appropriate | Substantive requirements are potential ARARs if nongame birds are identified at IRP Site 5 during removal action. Measures will be taken to avoid the take of nongame birds during removal action implementation. |
| Actions impacting fur-bearing mammals | Provides manners under which fur-bearing mammals may be taken. | | Cal. Fish & Game Code § 4000 et seq. | Not an ARAR | The scope of IRP Site 5 removal action does not include take of fur-bearing mammals. |
| Actions impacting nongame mammals | Nongame mammals or parts thereof may not be taken or possessed except as provided in this code or in accordance with regulations adopted by the commission | | Cal. Fish & Game Code § 4150 | Relevant and appropriate | Substantive requirement are potential ARARs if nongame mammals are identified at IRP Site 5 during removal action. Measures will be taken to avoid the take of nongame mammals during removal action implementation. |

Table A3-2 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Actions impacting fully protected mammals | Prohibits the take or possession of any of the following fully protected mammals or their parts: (1) Morro Bay kangaroo rat (2) Bighorn sheep except Nelson bighorn sheep (3) Northern elephant seal (4) Guadalupe fur seal (5) Ring-tailed cat (6) Pacific right whale (7) Salt-marsh harvest mouse (8) Southern sea otter (9) Wolverine. | | Cal Fish & Game Code § 4700 | Not an ARAR | Fully protected mammals have not been identified as occurring in habitat in the vicinity of IRP Site 5. |
| Actions impacting fully protected reptiles and amphibians | Prohibits the take or possession of the following fully protected reptiles and amphibians or parts thereof: Blunt-nosed leopard lizard (2) San Francisco garter snake (3) Santa Cruz long-toed salamander (4) Limestone salamander (5) Black toad | | Cal. Fish & Game Code §§ 5050 | Not an ARAR | Fully protected reptiles or amphibians have not been identified as occurring in habitat in the vicinity of IRP Site 5. |
| Actions impacting fully protected fish | Actions must be taken to prevent the take or possession of any fully protected fish species. | Fully protected fish | Cal. Fish & Game Code § 5515 | Not an ARAR | No fully protected fish species are known to occur in the habitat of Mugu Lagoon and such habitat does not occur at IRP Site 5. |
| Actions impacting mollusks, crustaceans, or other invertebrates | Action must be taken to avoid the take or possession of mollusks, crustaceans, or other invertebrates for a commercial purpose without a permit. | Mollusks, crustaceans, or other invertebrates | Cal. Fish & Game Code § 8500 | Not an ARAR | The scope of the removal action at IRP Site 5 does not include take or possession of mollusks, crustaceans, or other invertebrates for a commercial purpose. However, removal actions for IRP Site 5 would be conducted in a manner protective of wildlife of adjacent Mugu Lagoon. |

Table A3-2 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discharge to waters of the state | Prohibits the passage of enumerated substances or materials into waters of the state deleterious to fish, plant life, or birds. The section does not apply to a discharge or a release expressly authorized pursuant to waste discharge requirement of Section 13263 of the Cal. Water Code or a waiver issued pursuant to subdivision (a) of Section 13269 of the Cal. Water Code. | | Cal. Fish & Game Code §§ 5650(a), (b), and (f) | Relevant and Appropriate | Contaminated discharges to water are not proposed as a part of removal action; however, measures would be implemented to control erosion and runoff in excavated areas during removal action implementation. The substantive provisions of this regulation are relevant and appropriate for Alternatives 2 and 3. |
| California Code of Regulations^b | | | | | |
| Actions impacting native reptiles and amphibians | Prohibit capture, collect, intentionally kill or injure, possess, purchase, propagate, sell, transport, import, or export any native reptile or amphibian, or parts thereof unless under special permit from the department issued pursuant to Cal. Code Regs. tit. 14, §§ 650, 670.7, or 783 or as otherwise provided in the Fish and Game Code or these regulations. | Native reptiles and amphibians | Cal. Code Regs. tit. 14, § 40 | Not an ARAR | The scope of the removal action at IRP Site 5 does not include capture, collection, intentional killing or injury, possession, purchase, propagation, selling, transport, import, or export of any native reptile or amphibian. |
| Actions impacting furbearing mammals | Fisher, marten, river otter, desert kit fox and red fox may not be taken at any time. | Furbearing mammals | Cal. Code Regs. tit. 14, § 460 | Not an ARAR | The animals specified in the regulations have not been identified on or in the vicinity of IRP Site 5. |

Table A3-2 (continued)

| Location | Requirement | Prerequisite | Citation ^a | ARAR Determination | Comments |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Actions impacting furbearing mammals | Provides methods of take for other furbearing mammals not listed in Title C.C.R. section 460 | Furbearing mammals | Cal. Code Regs. tit. 14, § 465 | Not an ARAR | The animals specified in the regulations have not been identified on or in the vicinity of IRP Site 5. |
| Actions impacting nongame mammals | Action must be taken to avoid the take of nongame mammals except as provided in applicable regulations. | Nongame mammals. | Cal. Code Regs. tit. 14, § 472 | Not an ARAR | The wildlife referenced in the section are not known to occur at IRP Site 5. |
| California Coastal Act of 1976^b | | | | | |
| Coast | Regulates activities associated with development to control direct significant impacts on coastal waters and to protect state and national interests in California coastal resources. | Any activity which could impact coastal waters and resources. | Cal. Pub. Res. Code §§ 30000–30900; Cal. Code Regs. tit. 14, §§ 13001–13666.4 | Relevant and Appropriate | Not applicable because federal lands are specifically excluded from definition of the coastal zone. However, relevant and appropriate as IRP Site 5 is located in a coastal area. |

Notes:

^a only the substantive provisions of the requirements cited in this table are potential ARARs

^b statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs follow each general heading; only substantive requirements of the specific citations are considered potential ARARs

Acronyms/Abbreviations:

ARAR – applicable or relevant and appropriate requirement
Cal. Code Regs. – *California Code of Regulations*
Cal. Fish & Game Code – *California Fish and Game Code*
Cal. Pub. Res. Code – *California Public Resources Code*
CCC – California Coastal Commission
DON – Department of the Navy
§ – section
tit. – title

A4.ACTION-SPECIFIC ARARS

This EE/CA report evaluates removal action alternatives for COC-impacted sediment at the IRP Site 5. The ARARs analysis for contaminated sediment removal action is based on three alternatives. Alternative 1 is no action; Alternative 2 entails institutional controls; and Alternative 3 entails excavation of sediment with off-site treatment and disposal. Detailed descriptions of the removal alternatives for the contaminated sediment are provided in the main text of this EE/CA report.

Table A4-1 at the end of this section presents and evaluates potential federal action-specific ARARs for IRP Site 5. A discussion of the requirements determined to be pertinent to each alternative being evaluated for IRP Site 5 is presented in this section. A discussion of how the alternative complies with each identified ARAR is also provided.

A4.1 ALTERNATIVE 1 – NO ACTION

There is no need to identify ARARs for the no action alternative because ARARs apply to “any removal or remedial action conducted entirely on-site” and “no action” is not a removal or remedial action (CERCLA Section 121(e), 42 U.S.C. § 9621[e]). CERCLA Section 121 (42 U.S.C. § 9621), cleanup standards for selection of a Superfund remedy, including the requirement to meet ARARs, are not triggered by the no action alternative (U.S. EPA 1991b). Therefore, a discussion of compliance with action-specific ARARs is not appropriate for this alternative.

A4.2 ALTERNATIVE 2 – INSTITUTIONAL CONTROLS

Under Alternative 2, ICs would be designed and put in place to restrict site use and the uncontrolled disturbance and release of the COC-impacted sediment of AOEC 1. The COC-impacted sediment of AOEC 1 would remain in place. No removal measures would be implemented to reduce concentrations of COCs in the sediment, alter transport/exposure pathways, or reduce/limit risks to receptors (birds and small mammals). However, ICs would reduce the potential for increased birds and small mammals exposure to the sediment resulting from future migration and redeposition.

A4.2.1 Federal ARARs

No federal regulations exist regarding ICs for actions taken on active military facilities; however, Cal/EPA, U.S. EPA, and the DON have developed guidance pertaining to ICs at active military bases that will be used as TBC guidance in implementing the controls required for a remedial alternative.

The California Military Environmental Coordination Committee, consisting of Cal/EPA, U.S. EPA, and the DON, developed the Institutional Control Protocol at Open Bases in 1998 for application at active military installations (CMECC 1998). More recently, the DoD and U.S. EPA developed principles and procedures for specification, monitoring, and enforcement of LUCs, as the form of ICs to be implemented for remedial actions on active facilities. These guidances are consensus documents that are intended to aid federal and state remedial project managers when incorporating ICs into CERCLA remedial actions. The DON has agreed that these guidances should be followed for sites on active bases that require ICs as part of their CERCLA remedial action.

The LUC guidance identifies the SMP as typically the best place to record ICs to assure their implementation by the DoD installation. The plan establishes land uses for the DoD installation and requirements similar to zoning. The SMP is used by the installation for project planning and evaluation of land-use decisions. Depending on the installation’s project planning and project approval process, more than one document may be required to include the ICs in order to assure adherence to them. At NBVC Point Mugu, the SMP and the NBVC Regional Shore Infrastructure

Plan are the current applicable planning documents. ICs required for IRP Site 5 would be included for implementation in these documents..

A4.2.2 State ARARs

The DTSC provided requirements for ICs in California Civil Code § 1471 and California Health and Safety Code §§ 25202.5 and 25222.1 as potential action-specific ARARs for removal action at IRP Site 5. None of the regulation requirements identified by the state have been found to be applicable or relevant and appropriate because the requirements do not apply to sites on active facilities where property ownership will not be transferred.

A4.3 ALTERNATIVE 3 – EXCAVATION OF SEDIMENT WITH OFF-SITE TREATMENT AND DISPOSAL

Alternative 3 would involve excavation of 2,700 bank cubic yards of COC- impacted sediment at IRP Site 5, dewatering and chemical profiling of the excavated sediment, loading and transporting the impacted sediment to the landfill(s), and backfilling the excavation.

The excavated sediment would be temporarily stored in staging piles as for dewatering. Chemical profiling will be conducted for the dewatered sediment and the water generated as a result of sediment dewatering. Dewatered sediment will be loaded into trucks to be transported and disposed of at an approved disposal facility. The water generated as a result of sediment dewatering, if necessary, will be sent to an approved disposal facility. Following excavation, confirmation sampling would be conducted for cadmium, chromium, copper, nickel, lead, and silver to ensure that target cleanup goals based on removal action objectives are attained and are protective of birds and small mammals. Excavated areas would then be backfilled with clean sediment and compacted. Advice for the reconstitution of the salt marsh will be solicited from the California Department of Fish and Game. Surficial portions of the backfill would be designed and constructed with materials similar to the physical composition of the surrounding sediment bed, with the intent that the salt marsh ecological community would recolonize the backfill surface.

As part of the NBVC Point Mugu INRMP, the Navy has an ongoing program that includes annual monitoring of salt marsh bird's-beak habitat at NBVC Point Mugu. According to the 2007 survey, the closest mapped habitat is south of Beach Road and approximately 950 feet west of the IRP Site 5 boundary. The most recent survey will be consulted prior to removal action. Excerpts from the 2007 survey are provided as Attachment B of the Final FS (BEI 2008).

As a cooperative plan, the INRMP entails coordination with two regulatory agencies, the U.S. Fish and Wildlife Service and the California Department of Fish and Game. In accordance with the INRMP, Navy owned lands are managed to ensure that projects carried out by the Navy do not jeopardize the continued existence of salt marsh bird's-beak, and to help foster the recovery of salt marsh bird's-beak.

A4.3.1 Federal ARARs

A4.3.1.1 WASTE IDENTIFICATION AND ON-SITE MANAGEMENT

RCRA requirements for identification and management of excavated sediment and water generated as a result of sediment dewatering are potential federal action-specific ARARs for Alternative 3. The excavated sediment and water generated as a result of sediment dewatering would be subject to RCRA requirements at Cal. Code Regs. tit. 22, § 66262.10(a) and § 66262.11 to determine whether such wastes should be classified as hazardous.

The hazardous waste characteristics evaluation would be made at the time the waste is generated. The appropriate requirements outlined in Table A4-1 for storing, manifesting, and transporting this material for final disposal would need to be followed only in the event that the excavated sediment and water generated as a result of sediment dewatering are found to be classified as RCRA characteristic hazardous wastes.

A4.3.1.2 TEMPORARY STORAGE REQUIREMENTS

This alternative would include temporary storage of the excavated sediment, which may have composition similar to that of a RCRA hazardous waste (see Section A1.4.1). The time period of this temporary storage is not expected to exceed 2-years; therefore, a staging pile (if used) as defined in 40 C.F.R. § 264.554 (a) would be used for on-site temporary storage of sediment. The design, operating and closure criteria defined at 40 C.F.R. § 264.554(d)(1)(i-ii), (d)(2), (e), (f), (h), (i), (j), and (k), constitute potential ARARs for the staging pile (if used) used for temporary storage of the excavated sediment.

In addition, containers may also be used for temporary storage of the sediment. In the event that containers are used for on-site storage of sediment and sediment exhibits the characteristics of RCRA hazardous waste, the substantive RCRA container storage requirements at Cal. Code Regs. tit. 22, §§ 66264.171, 66264.172, 66264.173, 66264.174, and 66264.175(a) and (b) would be potential ARARs.

A4.3.2 State ARARs

State RCRA requirements included within the U.S. EPA-authorized RCRA program for California are considered to be potential federal ARARs and are discussed above. When state regulations are broader in scope than their federal counterparts, they are considered potential state ARARs. Excavated sediment would be subject to state requirements for characterization (Cal. Code Regs. tit. 22, § 66261.3[a][2][C] or 66261.3[a][2][F], 66261.22[a][3] and [4], 66261.24[a][2]–[a][8], and 66261.101). These requirements are potentially applicable for characterization prior to off-site disposal.

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**Table A4-1
Potential Federal Action-Specific ARARs**

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------|--------------------|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Action | Requirement | Prerequisite | Citation | ARAR Determination | | | Comments |
| | | | | A | RA | TBC | |
| Resource Conservation and Recovery Act (42 U.S.C. §§ 6901–6991[i])* | | | | | | | |
| On-site waste generation | Person who generates waste shall determine if that waste is a hazardous waste. | Generator of waste. | Cal. Code Regs. tit. 22, § 66262.10(a), 66262.11 | 3 | | | Applicable for any operation where hazardous waste is generated. The determination of whether the excavated sediment and/or wastes generated during removal activities, such as water from sediment dewatering are hazardous will be made at the time the wastes are generated. |
| | Requirements for analyzing waste for determining whether waste is hazardous. | Generator of waste. | Cal. Code Regs. tit. 22, § 66264.13(a) and (b) | 3 | | | Applicable when analyzing waste generated during the removal action at IRP Site 5. |
| Hazardous waste accumulation | Onsite hazardous waste accumulation is allowed for up to 90 days as long as the waste is stored in containers in accordance with § 66262.171–178 or in tanks, on drip pads, inside buildings, and is labeled and dated, etc. | Accumulate hazardous waste. | Cal. Code Regs. tit. 22 § 66262.34 | 3 | | | In the event that containers are used for on-site storage of sediment and sediment exhibits the characteristics of RCRA hazardous waste, substantive requirements would be potentially applicable for accumulation of waste for less than 90 days. Wastes will not be stored on site for greater than 90 days. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Action | Requirement | Prerequisite | Citation | ARAR Determination | | | Comments |
| | | | | A | RA | TBC | |
| Site closure | Minimize the need for further maintenance controls and minimize or eliminate, to the extent necessary to protect human health and the environment, postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or runoff, or waste decomposition products to groundwater or surface water or to the atmosphere. | Hazardous waste management facility. | Cal. Code Regs. tit. 22, § 66264.111(a) and (b) | 3 | | | In the event that staging piles are used, substantive provisions of this regulation are potentially applicable for closing staging piles. |
| Clean closure | During the partial and final closure periods, all contaminated equipment, structures and soils shall be properly disposed or decontaminated by removing all hazardous waste and residues. | Hazardous waste management facility. | Cal. Code Regs. tit. 22, § 66264.114 | | 3 | | The substantive requirements of the cited regulation are determined to be potentially relevant and appropriate for Alternative 3 for the contaminated sediment. |
| Container storage | Containers of RCRA hazardous waste must be: <ul style="list-style-type: none"> maintained in good condition, compatible with hazardous waste to be stored, and closed during storage except to add or remove waste. | Storage of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere, in a container. | Cal. Code Regs. tit. 22, § 66264.171, .172, .173 | 3 | | | In the event that containers are used for on-site storage of sediment and sediment exhibits the characteristics of RCRA hazardous waste, substantive requirements would be potentially applicable for accumulation of waste for less than 90 days. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------|----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Container storage (continued) | Inspect container storage areas weekly for deterioration. | | Cal. Code Regs. tit. 22, § 66264.174 | 3 | | | In the event that containers are used for on-site storage of sediment and sediment exhibits the characteristics of RCRA hazardous waste, substantive requirements would be potentially applicable for accumulation of waste for less than 90 days. |
| | Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system. | Storage in a container of RCRA hazardous waste not meeting small-quantity generator criteria before treatment, disposal, or storage elsewhere. | Cal. Code Regs. tit. 22, § 66264.175(a) and (b) | 3 | | | In the event that containers are used for on-site storage of sediment and sediment exhibits the characteristics of RCRA hazardous waste, substantive requirements would be potentially applicable for accumulation of waste for less than 90 days. |
| | Keep containers of ignitable or reactive waste at least 50 feet from the facility property line. | Ignitable or reactive waste. | Cal. Code Regs. tit. 22, § 66264.176 | | | | Not an ARAR. The sediment contamination at IRP Site 5 is not ignitable or reactive based on knowledge of the nature and concentrations of contaminants in the sediment. However, onsite storage of excavated sediment would be conducted in a manner that does not present unacceptable risks to site workers and surrounding communities (if any). |
| | Keep incompatible materials separate. Separate incompatible materials stored near each other by a dike or other barrier. | | Cal. Code Regs. tit. 22, § 66264.177 | 3 | | | Potentially applicable for temporary storage of incompatible materials. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|--------------------|----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Container storage (continued) | At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers and liners. | | Cal. Code Regs. tit. 22, § 66264.178 | 3 | | | Potentially applicable if RCRA hazardous wastes are generated and stored for less than 90 days. |
| Use of tank systems | Requirements for the design and installation of new tank systems including strength, tightness testing, damage control, support, corrosion control, etc. | Tank systems for transferring, storing, or treating hazardous waste. | Cal. Code Regs. tit. 22, § 66264.192(a), (b), (c), (e), (f), and (g) | 3 | | | Substantive requirements are potentially applicable if the contaminated sediment or water generated as a result of sediment dewatering is classified as RCRA hazardous and tank systems are used for its storage. |
| Use of tanks or piping | Requirements for secondary containment of tank systems. | Tank systems for transferring, storing, or treating hazardous waste. | Cal. Code Regs. tit. 22, § 66264.193(b), (c), (d), and (e) | 3 | | | Substantive requirements are potentially applicable if the contaminated sediment or water generated as a result of sediment dewatering is classified as RCRA hazardous and tank systems are used for its storage. |
| | Requirements for secondary containment of ancillary equipment. | Tank systems for transferring, storing, or treating hazardous waste. | Cal. Code Regs. tit. 22, § 66264.193(f) | 3 | | | Substantive requirements are potentially applicable if the contaminated sediment or water generated as a result of sediment dewatering is classified as RCRA hazardous and tank systems are used for its storage. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------|--------------------|----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Use of tank systems | Requirements for operation of tank systems including spill prevention and prohibitions of material that could cause failure. | Tank systems for transferring, storing, or treating hazardous waste. | Cal. Code Regs. tit. 22, § 66264.194(a) and (b) | 3 | | | Substantive requirements are potentially applicable if the contaminated sediment or water generated as a result of sediment dewatering is classified as RCRA hazardous and tank systems are used for its storage. |
| | Requirements for inspection of tank systems including inspection of overflow protection, corrosion, release, detection equipment, and cathodic protection. | Tank systems for transferring, storing, or treating hazardous waste. | Cal. Code Regs. tit. 22, § 66264.195(a), (b), and (c) | 3 | | | Substantive requirements are potentially applicable if the contaminated sediment or water generated as a result of sediment dewatering is classified as RCRA hazardous and tank systems are used for its storage. |
| | Requirements for response to leaks and spills from tank systems including removal of system from use if appropriate, containment, cleanup, emergency procedures, etc. | Tank systems for transferring, storing, or treating hazardous waste. | Cal. Code Regs. tit. 22, § 66264.196(b) except (b)(5) and (b)(7) | 3 | | | Substantive requirements are potentially applicable if the contaminated sediment or water generated as a result of sediment dewatering is classified as RCRA hazardous and tank systems are used for its storage. |
| | Requirements for closure and postclosure care of tank systems decontamination, clean closure and leaving waste in place at closure. | Tank systems for transferring, storing, or treating hazardous waste. | Cal. Code Regs. tit. 22, § 66264.197(a) and (b) | 3 | | | Substantive requirements are potentially applicable if the contaminated sediment or water generated as a result of sediment dewatering is classified as RCRA hazardous and tank systems are used for its storage. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Placement of waste in land disposal units | Movement of excavated materials to new location and placement in or on land will trigger LDRs for the excavated waste or closure requirements for the unit in which the waste is being placed. | Materials containing RCRA hazardous wastes subject to LDRs are placed in another unit | Cal. Code Regs. tit. 22, § 66268.40 | | | | Not an ARAR. It is not anticipated that any RCRA hazardous wastes generated during the removal action will be placed outside the area of contamination. Therefore, LDRs are not ARARs. |
| | Treatment of waste subject to ban on land disposal must attain levels achievable by BDAT for each hazardous constituent in each listed waste, if residual is to be land disposed. | Placement of RCRA hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, or underground mine or cave. | Cal. Code Regs. tit. 22, § 66268.42 | | | | Not an ARAR. No constituents with standards expressed as treatment method are expected in the excavated sediment from IRP Site 5. In addition, RCRA hazardous wastes generated during the removal action will not be placed outside the area of contamination. |
| | BDAT standards for spent solvent wastes and dioxin-containing wastes are based on one of four technologies or combinations: for wastewaters, (1) steam stripping, (2) biological treatment, or (3) carbon absorption; and for all other wastes, (4) incineration. Any technology may be used, however, if it will achieve the concentration levels specified. | Solvent or dioxin-containing wastes. | Cal. Code Regs. tit. 22, § 66268.30 and 66268.31 | | | | Not an ARAR. No wastes classified as spent solvents or containing dioxins are expected during the removal action. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
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| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Clean closure | Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste. If waste is left on site, closure and postclosure care requirements are necessary. | Surface impoundments, container or tank liners, and hazardous waste residues or contaminated soil (including soil from dredging or soil disturbed in the course of drilling or excavation) returned to land. Not applicable to material treated, stored, or disposed only before the effective date of the requirements, or if treated <i>in situ</i> or consolidated within the area of contamination. | Cal. Code Regs. tit. 22, § 66264.228(a), (b), (e)–(k), (m), and (o)–(q) except as it cross-references procedural requirements such as closure plans and annual reports. | | | | Not an ARAR. No land-based disposal units are planned for waste management. |
| Waste pile | Use a single liner and leachate collection system. Waste put into waste pile is subject to land ban regulations. | RCRA hazardous waste, noncontainerized accumulation of solid, nonflammable hazardous waste that is used for treatment or storage. | Cal. Code Regs. tit. 22, § 66264.251 (except 251[j], 251[e][11]) | | | | Not an ARAR. Wastes are not planned to be managed in waste piles as part of this removal action. |
| | Alternative requirements that are protective of human health or the environment may replace design, operating, or closure standards for temporary tanks and container storage areas. | | Cal. Code Regs. tit. 22, § 66264.553(b), (d), (e), and (f) | | | | Not an ARAR. Container storage requirements at Cal. Code Regs. tit. 22 §§ 66264.171-175 and 66264.177-178 are determined to be potentially applicable. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
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| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Waste pile (continued) | Allows generators to accumulate solid remediation waste in a U.S. EPA-designated pile for storage only, up to 2 years, during remedial operations without triggering LDRs. | Hazardous remediation waste temporarily stored in piles. | 40 C.F.R. § 264.554(d)(1) (i–ii) and (d)(2), (e), (f), (h), (i), (j), and (k) | 3 | | | Substantive provisions are potentially applicable for temporary storage of excavated sediment, if the sediment exhibits the characteristics of the RCRA hazardous waste and staging piles are used for its storage. |
| | Prevent run-on and control and collect runoff from a 24-hour 25-year storm (waste piles, land treatment facilities, landfills). Prevent overtopping of surface impoundments. | RCRA hazardous waste treated, stored, or disposed after the effective date of the requirements. | Cal. Code Regs. tit. 22, § 66264.221(c), (e), (h); § 66264.251(c), (d), (f), (g), (h), (k); § 66264.273(c), (d), (j)(1); § 66264.301(c), (d), (f), (g) | | | | Not an ARAR. No waste piles, land treatment facilities, or landfills are planned for waste management. |
| Closure of waste pile | At closure, owner shall remove or decontaminate all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste. If waste is left on-site, perform postclosure care in accordance with the closure and postclosure care requirements that apply to landfills. | Waste pile used to store hazardous waste. | Cal. Code Regs. tit. 22, § 66264.258(a) and (b) except references to procedural requirements | 3 | | | Substantive provisions are potentially applicable for closing staging piles (if used). |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----|-----|---------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| CAMU | An area at a RCRA facility may be designated as a CAMU. Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes nor creation of a unit subject to minimum technology requirements or LDRs. | RCRA CAMU. | Cal. Code Regs. tit. 22, § 66264.552(c) and (e) | | | | Not an ARAR. Removal actions will not involve creation of a CAMU. |
| Use of equipment that contacts hazardous waste with organic concentrations greater than 10 percent by weight | Air emission standards for process vents or equipment leaks. | Equipment that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight or process vents associated with specified operations that manage hazardous wastes with organic concentrations of at least 10 ppm _w . | Cal. Code Regs. tit. 22, § 66264.1030–1034 (excluding 1030[c], 1033[j], 1034[c][2], 1034[d][2]); 66264.1050–1063 (excluding 1050[c], 1050[d], 1057[g][2], 1061[d], 1063[d][3]) | | | | Not an ARAR. No hazardous wastes are present with organic concentrations greater than 10 percent. |
| Treatment in a miscellaneous unit | Design and operating standards for unit in which hazardous waste is treated. | Treatment of hazardous waste in a unit. | Cal. Code Regs. tit. 22, § 66264.601 | | | | Not an ARAR. No miscellaneous hazardous waste treatment unit is planned. |
| Cleantidal Water Act, as Amended (33 U.S.C., ch. 26, §§ 1251–1387)* | | | | | | | |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------|--------------------|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Discharge to surface waters | Owners and operators of construction activities must be in compliance with discharge standards. | | CWA Section 402 (33 U.S.C. ch. 26, § 1342); 40 C.F.R. § 122.44(k)(2) and (4) | 3 | | | Administrative requirements including permit do not constitute potential ARARs. Removal actions proposed do not include direct discharge, but have the potential for incidental discharge of impacted sediment to surface water through erosion and runoff. Measures would be taken during the removal action to minimize the potential for said discharge to the Mugu Lagoon. However substantive requirements are potential ARARs for discharge of water from dewatering process to tidal creek. The substantive requirements also constitute potential ARARs for storm water discharges during construction activities. |
| Dredging | Exempts from RCRA requirements, hazardous waste handled under the 40 C.F.R. § 261.4(g) which states that dredged material that is subject to the requirements of a permit that has been issued under 404 of the Federal Water Pollution Control Act (33 U.S.C. § 1344) or section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. § 1413) is not a hazardous waste. | Hazardous solely due to the characteristic of toxicity. | Cal. Code Regs. tit. 22, § 66261.4(g)(11) | 3 | | | Substantive requirements are potential ARARs for the response action to be conducted under Alternative 3. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------|--------------------|----|-----|---------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Discharge of dredged material | Guidelines for specification of disposal sites for dredged material. The discharge must represent the least damaging, practicable alternative. The discharge of dredged material must not result in significant degradation of the aquatic ecosystem. All practicable means must be utilized to minimize adverse environmental impacts. | Discharge of dredged material to waters of the United States. | 40 C.F.R. § 230.10(a), (c), and (d) | 3 | | | Substantive provisions are potentially applicable for the excavation of sediment in the wetland. |
| | Where the proposed discharge and dredging sites are adjacent and are comprised of similar materials and subject to the same sources of contaminants, disposal may be conducted without further testing because discharge is not likely to result in degradation of the discharge site, as long as the potential spread of contaminants to less contaminated areas can be prevented. | | 40 C.F.R. § 230.60(c) | 3 | | | Substantive provisions are potentially applicable for the excavation of sediment in the wetlands. |
| | The discharge of dredged material may be conducted without further testing if constraints are available to reduce contamination to acceptable levels within the discharge site and to prevent contaminants from being transported beyond the proposed discharge site boundaries. | | 40 C.F.R. § 230.60(d) | 3 | | | Substantive provisions are potentially applicable for the excavation of sediment in the wetlands. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------|----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Discharge of dredged Material (continued) | Evaluation and testing requirements for discharges of dredged material to waters of the United States. | | 40 C.F.R. § 230.61 | 3 | | | Substantive provisions are potentially applicable for the excavation of sediment in the wetlands. |
| | Guidance to comply with substantive provisions of the 40 C.F.R. § 220–228 criteria. Guidance for dredged material testing necessary to determine compliance with state water quality standards. | | Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. (Inland Testing Manual) | | | 3 | The manual constitutes potential TBC guidance to comply with substantive requirements of Section 404(b)(1) of the CWA. |
| | U.S. Army Corps of Engineers requirements for permitting discharges of dredged material to waters of the United States. | Discharge of dredged material to waters of the United States. | 33 C.F.R. § 320–330 | 3 | | | Substantive provisions are potentially applicable for the excavation of sediment in the wetlands. |
| Marine Protection Research and Sanctuaries Act of 1972* | | | | | | | |
| | Authorization of the U.S. Army Corps of Engineers for the transportation of dredged material for the purpose of dumping it in ocean waters of the United States. | Ocean waters of the United States. | 33 U.S.C. §§ 103 (Pub. L. No. 92-532) and 1413 | | | | Not an ARAR. The excavated sediment material is not expected to be discharged to the ocean waters of the United States during the removal action implementation. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
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| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| | All proposed operations involving the transportation and dumping of dredged material into ocean waters have to be evaluated to determine the postdisposal environmental impact of such activities; the criteria for evaluation of these materials are provided in 40 C.F.R. pts. 220–228. | Ocean waters of the United States. | 33 U.S.C. §§ 103 (Pub. L. No. 92-532) and 1413 | | | | Not an ARAR. The excavated sediment material is not expected to be discharged to the ocean waters of the United States during the removal action implementation. |
| Clean Air Act (42 U.S.C. §§ 7401–7671)* | | | | | | | |
| Discharge to air | Provisions of SIP approved by U.S. EPA under Section 110 of CAA. | Major sources of air pollutants. | 40 U.S.C. § 7410; portions of 40 C.F.R. § 52.220 | | | | Not an ARAR in and of itself; however, includes by reference local regulations that are evaluated separately as potential ARARs. See regulation requirements of the VCAPCD included as provisions of the SIP evaluated below. |
| | NAAQS primary and secondary standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead). | Contamination of air affecting public health and welfare. | 40 C.F.R. § 50.4–50.12 | | | | Not an ARAR. Federal NAAQS are nonenforceable standards. |
| Air Quality Management District/Air Pollution Control District* | | | | | | | |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
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| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Permits Required | A person shall not build, erect, install, modify, relocate or replace any emissions unit at a stationary source without first obtaining an Authority to Construct. An Authority to Construct shall be required for any new emissions unit, modified emissions unit, relocated emissions unit, or replacement emissions unit. An Authority to Construct shall also be required for any physical change to an emissions unit which may alter the emissions of air contaminants. | | VCAPCD Regulation II, Rule 10 | | | | Not an ARAR. The requirement is procedural in nature; to constitute an ARAR a requirement must be substantive. In addition, CERCLA actions are not subject to permit requirements under Section 121(e) of CERCLA (42 U.S.C. ch. 103 § 9621[e][1]). |
| Exemptions from Permit | Requirements pertaining to compliance with emission standards and prohibitions. The owner or operator shall provide, as required by the District, calculations, usage records, emissions records and/or operational data as necessary to substantiate any exemptions that apply to the subject facility. | | VCAPCD Regulation II, Rule 23 | | | | Not an ARAR. The requirement is procedural in nature; to constitute an ARAR a requirement must be substantive. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
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| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| New Source Review | Specifies the New Source Review provisions that are applicable to new, replacement, modified or relocated emissions units in Ventura County. These provisions shall be applicable on a pollutant-by-pollutant and an emissions unit-by-emissions unit basis. Applications received by the Air Pollution Control District shall be subject to the version of this rule in effect at the time such application is deemed complete, regardless of the date on which the new or replacement emissions unit is installed, or the date on which the emissions unit is modified or relocated. | | VCAPCD Regulation II, Rule 26 | | | | Not an ARAR. The requirement is procedural in nature; to constitute an ARAR a requirement must be substantive. |
| Air emissions | No person shall discharge into the atmosphere from any single source of emissions any air contaminant for more than 3 minutes in any 60-minute period that is as dark as or darker than number 1 on the Ringelmann chart. | Discharge of any air contaminant other than uncombined water vapor. | VCAPCD Regulation IV, Rule 50 | 3 | | | Substantive provisions are potentially applicable for limiting dust during proposed excavation, filling, and grading. |
| Soil Decontamination Operations | Pertains requirements to the operation of a vapor extraction, bioremediation, or bioventing system. | | VCAPCD Regulation IV, Rule 74.29 | | | | Not an ARAR. Not pertinent to the scope of removal action. |
| Federal Hazardous Materials Transportation Law (49 U.S.C. §§ 5101–5127)* | | | | | | | |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
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| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Transportation of hazardous material | No person shall represent that a container or package is safe unless it meets the requirements of 49 U.S.C. §§ 5101–5127. | Interstate carriers transporting hazardous waste and substances by motor vehicle. Transportation of hazardous material under contract with any department of the executive branch of the federal government. | 49 C.F.R. § 171.2(f) | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| | No person shall unlawfully alter or deface labels, placards or descriptions, packages, containers, or motor vehicles used for transportation of hazardous materials. | | 49 C.F.R. § 171.2(g) | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| Hazardous materials marking, labeling, and placarding | Each person who offers hazardous material for transportation or each carrier that transports it shall mark each package, container, and vehicle in the manner required. | Person who offers hazardous material for transportation; carries hazardous material; or packages, labels, or placards hazardous material. | 49 C.F.R. § 172.300 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| | Each person offering nonbulk hazardous materials for transportation shall mark the proper shipping name and identification number (technical name) and consignee's name and address. | | 49 C.F.R. § 172.301 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
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| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Hazardous materials marking, labeling, and placarding (continued) | Hazardous materials for transportation in bulk packages must be labeled with proper ID number, specified in 49 C.F.R. § 172.101 table, with required size of print. Packages must remain marked until cleaned or refilled with material requiring other marking. | | 49 C.F.R. § 172.302 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| | No package marked with a proper shipping name or ID number may be offered for transport or transported unless the package contains the identified hazardous material or its residue. | | 49 C.F.R. § 172.303 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| | The markings must be durable, in English, in contrasting colors, unobscured, and away from other markings. | | 49 C.F.R. § 172.304 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| | Nonbulk combination packages containing liquid hazardous materials must be packed with closures upward, and marked with arrows pointing upward. | | 49 C.F.R. § 172.312 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| | Labeling of hazardous material packages shall be as specified in the list. | | 49 C.F.R. § 172.400 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| Hazardous materials marking, labeling, and placarding (continued) | Each bulk packaging or transport vehicle containing any quantity of hazardous material must be placarded on each side and each end with the type of placards listed in Tables 1 and 2 of 49 C.F.R. § 172.504. | Each person who offers for transport or transports any hazardous materials shall comply with these placarding requirements. | 49 C.F.R. § 172.504 | | 3 | | Substantive requirements are potentially relevant and appropriate for transportation of hazardous materials (if any) on site. |
| Solid waste disposal facility | A facility or practice shall not: contaminate an underground drinking water source beyond the solid waste boundary or a court- or state-established alternative; cause a discharge of pollutants into waters of the United States that is in violation of the substantive requirements of the NPDES under CWA Section 402, as amended; cause a discharge of dredged material or fill material to waters of the United States that is in violation of the substantive requirements of CWA Section 404; or cause nonpoint source pollution of waters of the United States that violates applicable legal substantive requirements implementing an areawide or statewide water quality management plan approved by the Administrator under CWA Section 208, as amended. | Solid waste disposal facility and practices except agricultural wastes, overburden resulting from mining operations, land application of domestic sewage, location and operations of septic tanks, solid or dissolved materials in irrigation return flows, industrial discharges that are point sources subject to permits under CWA, source special nuclear or byproduct material as defined by the Atomic Energy Act, hazardous waste disposal facilities that are subject to regulation under RCRA subtitle C, disposal of solid waste by underground well | 40 C.F.R. § 257.3–257.4 and Appendix I | | 3 | | The substantive provisions are relevant and appropriate for Alternative 3 if the water generated as a result of sediment dewatering is classified as RCRA hazardous waste. |

Table A4-1 (continued)

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------|----------|--------------------|----|-----|----------|
| | | | | ARAR Determination | | | Comments |
| Action | Requirement | Prerequisite | Citation | A | RA | TBC | |
| | | injection, and municipal solid waste landfill units. | | | | | |

Note:

* statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader. Listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of specific citations are considered potential ARARs

Acronyms/Abbreviations:

A – applicable

ARAR – applicable or relevant and appropriate requirement

BAAQMD – Bay Area Air Quality Management District

BACT – best available control technology

BDAT – best demonstrated available technology

CAA – Clean Air Act

Cal. Code Regs. – *California Code of Regulations*

CAMU – corrective action management unit

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act

C.F.R. – *Code of Federal Regulations*

ch. – chapter

CWA – Clean Water Act

DON – Department of the Navy

EE/CA – Engineering Evaluation/Cost Analysis

°F – degrees Fahrenheit

FS – feasibility study

IRP – Installation Restoration Program

kg/day – kilograms per day

LAER – lowest achievable emission rate

LDR – land disposal restriction

MCAS – Marine Corps Air Station

MCL – maximum contaminant level

mg/dscm – milligrams per dry standard cubic meter

NAAQS – National Ambient Air Quality Standards (primary and secondary)

NPDES – National Pollutant Discharge Elimination System

OU – operable unit

PCB – polychlorinated biphenyl
PM₁₀ – particulate matter, less than 10 micrometers in diameter
POC – point of compliance
ppm – parts per million
ppm_w – parts per million by weight
pt. – part
Pub. L. No. – public law number
RA – relevant and appropriate
RAO – remedial action objective
RCRA – Resource Conservation and Recovery Act
RI – remedial investigation
§ – section
SCAQMD – South Coast Air Quality Management District
SDAPCD – San Diego Air Pollution Control District
SDWA – Safe Drinking Water Act
SIP – State Implementation Plan
subpt. – subpart
TBC – to be considered
TCE – trichloroethene
tit. – title
TSCA – Toxic Substances Control Act
UIC – underground injection control
U.S. – United States
U.S.C. – *United States Code*
USDW – underground source of drinking water
U.S. EPA – United States Environmental Protection Agency
VOC – volatile organic compound

Table A4-2
Potential State Action-Specific ARARs

| Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------|--------------------|----|-----|-------------------------------------------------------------------------------------------------------------------|
| Action | Requirement | Prerequisite | Citation | ARAR Determination | | | Comments |
| | | | | A | RA | TBC | |
| California Civil Code* | | | | | | | |
| Land-use controls | Provides conditions under which land-use restrictions will apply to successive owners of land. | Transfer property from the DON to a nonfederal agency. | Cal. Civ. Code § 1471 | | | | The identified regulation is not an ARAR, since the transfer of ownership of IRP Site 5 property is not proposed. |
| California Health and Safety Code* | | | | | | | |
| Land-use controls | Allows DTSC to enter into an agreement with the owner of a hazardous waste facility to restrict present and future land uses. | Transfer property from the DON to a nonfederal agency. | Cal. Health & Safety Code § 25202.5 | | | | The identified regulation is not an ARAR, since the transfer of IRP Site 5 property is not proposed. |
| | Provides a streamlined process to be used to enter into an agreement to restrict specific use of property in order to implement land-use restrictions. | Transfer property from the DON to a nonfederal agency. | Cal. Health & Safety Code § 25222.1 | | | | The identified regulation is not an ARAR, since the transfer of IRP Site 5 property is not proposed. |
| Air Quality Management District/Air Pollution Control District* | | | | | | | |

Removal Action Alternatives for COC-Impacted Sediment: Alternative 1: No Action, Alternative 2: Institutional Controls, Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal

| Action | Requirement | Prerequisite | Citation | ARAR Determination | | | Comments |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------|-----------------------|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | | A | RA | TBC | |
| Discharge of air emissions | A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endangers the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property. | | VCAPCD Regulation IV, Rule 51 | | | | Not an ARAR. The DON is troubled by the vague, subjective nature of the nuisance rule and the lack of objective standards, as well as the inclusion of subjective nonenvironmental criteria such as "annoyance, repose, and comfort," and so forth. The requirements of 40 C.F.R. § 300.5 specify that an ARAR must be an environmental or facility siting requirement or limitation. Rule 51 does not fall within the definition of those terms and is therefore not an ARAR. The DON has determined that Rule 51 is not an ARAR for the proposed removal action at IRP Site 5. |
| Excavation and backfill | No hazardous materials shall be discharged from any source so as to result in concentrations at or beyond the property line in excess of any State, Federal or local standards or emissions limits established. In the absence of specific standards for a particular hazardous material, the airborne concentrations of such materials shall not exceed those levels and time intervals established by the State Division of Industrial Safety or the Occupational Safety and Health Administration. | Discharge of hazardous material to air. | VCAPCD Regulation IV, Rule 62.1 | 3 | | | Substantive provisions are potentially applicable for the proposed removal actions. However, toxic emissions to the air are not expected, and the dust control proposed should adequately control the potential for any toxics if present. |

Note:

- * statutes and policies, and their citations, are provided as headings to identify general categories of potential ARARs for the convenience of the reader; listing the statutes and policies does not indicate that the DON accepts the entire statutes or policies as potential ARARs; specific potential ARARs are addressed in the table below each general heading; only substantive requirements of the specific actions are considered potential ARARs

Acronyms/Abbreviations:

A – applicable
AOEC – area of ecological concern
ARAR – applicable or relevant and appropriate requirement
bgs – below ground surface
Cal. Civ. Code – *California Civil Code*
Cal. Code Regs. – *California Code of Regulations*
Cal. Fish & Game Code – *California Fish and Game Code*
Cal. Health & Safety Code – *California Health and Safety Code*
DON – Department of the Navy
DTSC – (California Environmental Protection Agency) Department of Toxic Substances Control
IR – Installation Restoration (Program)
RA – relevant and appropriate
§ – section
TBC – to be considered
tit. – title
VCAPCD – Ventura County Air Pollution Control District

A5.SUMMARY

The substantive provisions of National ambient water quality standards at 40 C.F.R. §§ 131.36(b) and 131.38 were determined to be potential ARARs for discharges associated with sediment dewatering to tidal creek proposed under Alternative 3.

Federal and state requirements that define hazardous waste are potential ARARs for hazardous waste evaluation of sediment generated as a result of excavation and evaluation of water generated as a result of sediment dewatering proposed under Alternative 3 at IRP Site 5. The federal requirements include Cal. Code Regs. tit. 22, § 66261.21, 66261.22(a)(1), 66261.23, 66261.24(a)(1), and 66261.100. The state requirements include Cal. Code Regs. tit. 22 § 66261.22(a)(3) and (4), § 66261.24(a)(2)–(a)(8), § 66261.101, § 66261.3(a)(2) (C), and § 66261.3(a)(2) (F).

Wetlands protection, biological resources, and coastal resources are the resource categories relating to location-specific requirements potentially affected by the IRP Site 5 response actions. Therefore, substantive requirements at 40 C.F.R. § 6.302 (a) and CWA Section 404 (33 U.S.C. § 1344) are potentially relevant and appropriate for protection of wetlands. Since IRP Site 5 may have protected species and migratory birds, the removal action for IRP Site 5 would need to comply with the substantive provisions of the Endangered Species Act and Migratory Bird Treaty Act. In addition, substantive requirements of Cal. Fish and Game Code §§ 2080, 3005, 3503.5, 3511, 3800, 4150, and 5600 (a), (b), & (f) are potential state ARARs for IRP Site 5 removal action if the animal and bird species specified in the regulations are identified at the site. Measures will be taken to avoid the take of birds or animals identified in the regulations during the implementation of removal action at IRP Site 5. In addition, the substantive provisions of the Coastal Zone Management Act are potentially relevant and appropriate since IRP Site 5 is located on a sand bar between Mugu Lagoon and the Pacific Ocean.

Actions evaluated as a part of the contaminated sediment removal action alternatives for IRP Site 5 included waste identification, on-site temporary storage; and on-site placement of treated sediment. The excavated sediment and water generated as a result of sediment dewatering would be subject to RCRA requirements at Cal. Code Regs. tit. 22, § 66262.10(a) and § 66262.11 to determine whether such wastes should be classified as hazardous. The requirements of 40 C.F.R. § 264.554(d)(1)(i-ii), (d)(2), (e), (f), (h), (i), (j), and (k) constitute potential ARARs for temporary storage of the excavated sediment in a staging pile.

This alternative would include temporary storage of the excavated sediment, which may have composition similar to that of a RCRA hazardous waste (see Section A1.4.1). The time period of this temporary storage is not expected to exceed 2-years; therefore, a staging pile as defined in 40 C.F.R. § 264.554 (a) would be used for on-site temporary storage of sediment. The design, operating and closure criteria defined at 40 C.F.R. § 264.554(d)(1)(i-ii), (d)(2), (e), (f), (h), (i), (j), and (k), constitute potential ARARs for the staging pile used for temporary storage of the sediment that exhibits the characteristics of RCRA hazardous waste. In the event that containers are used for on-site storage of sediment and sediment exhibits the characteristics of RCRA hazardous waste, the substantive RCRA container storage requirements at Cal. Code Regs. tit. 22, §§ 66264.171, 66264.172, 66264.173, 66264.174, and 66264.175(a) and (b) would be potential ARARs.

The substantive provisions of CWA Section 402 (33 U.S.C. ch. 26, § 1342) and 40 C.F.R. § 122.44(k)(2) and (4) are potential federal ARARs for incidental discharge of impacted sediment to surface water through erosion and runoff, discharge of water from the dewatering process to the tidal creek, and for storm water discharges during construction activities. In addition, the substantive provisions of 40 C.F.R. § 230.10(a), (c), and (d); 230.60(c) and (d); and 230.61 are potential federal ARARs for the excavation of the contaminated sediment in the wetlands at IRP Site 5.

The requirements of the VCAPCD that have been approved into the SIP and are therefore considered to be potential federal ARARs include substantive provisions of the Rule 50. In addition the substantive requirements of VCAPCD Rule 62.1 constitute potential state ARARs.

A6. REFERENCES

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Attachment 1
Correspondence – State ARAR Identification



Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630



Gray Davis
Governor

September 30, 2003

Mr. Michael Gonzales
Remedial Project Manager, Code 5DEN.MG
Naval Facilities Engineering Command
Southwest Division
1220 Pacific Highway
San Diego, California 92132-5190

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) FOR
FEASIBILITY STUDY AT INSTALLATION RESTORATION (IR) SITE 5, NAVAL BASE
VENTURA COUNTY, POINT MUGU, CALIFORNIA

Dear Mr. Gonzales:

This letter transmits the potential state ARARs the Navy requested in the preparation of a Feasibility Study (FS) for Site 5 at Point Mugu. At this time, we are forwarding the enclosed ARARs received from the following agencies:

- Ventura County Air Pollution Control District
- California Department of Transportation
- California Department of Fish and Game
- Department of Toxic Substances Control

The enclosed potential ARARs from the Department of Toxic Substances Control (DTSC) are divided into three specific categories—chemical, location, and action. We also identified some other state advisories, guidance, and criteria to be considered in the evaluation of the remedial alternatives.

DTSC will forward any additional ARARs if received from non-responding agencies at a later date. As you already know, the ARAR analysis is an iterative process and when the remedial alternatives are more fully developed in the FS, certain ARARs may no longer apply or additional ARARs may become apparent.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov.

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Mr. Michael Gonzales
September 30, 2003
Page 2

DTSC looks forward to work closely with the Navy on the remediations at Point Mugu. If you have any question, please call me at (714) 484-5431.

Sincerely,



Peter Chen
Hazardous Substances Engineer
Office of Military Facilities
Southern California Branch

Enclosures

cc: Mr. Alan Vancil
Southwest Division, NAVFAC Code 5DEN.AV
1220 Pacific Highway, Building 131
San Diego, California 92132-5190

Mr. Steve Granade
Environmental Division, Code N45V
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, California 93042-5001

Ms. Patty Velez
California Department of Fish and Game
Office of Spill Prevention and Response
Scientific Branch – Resource Assessment
20 Lower Ragsdale, Suite 100
Monterey, California 93940

California Department of Transportation
District 7
120 S. Spring Street
Los Angeles, California 90012

Mr. Michael Gonzales
September 30, 2003
Page 3

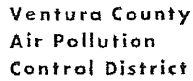
cc: Mr. Kerby Zozula
Engineering Division
Ventura County Air Pollution Control District
669 County Square Drive
Ventura, California 93003

Mr. Peter Rafferty
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, suite 200
Los Angeles, California 90013

Mr. Scott Humpert
California Integrated Waste Management Board
Permitting and Enforcement Division
1001 I Street
Sacramento, California 95814

Mr. Mark Delaplaine
Office of Federal Consistency
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105-2219

Mr. Emad Yemut
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630-4732



tel 805/645-1400
fax 805/645-1444
www.vcapcd.org

July 16, 2003

Subject: ARARs – Site 5 at Naval Base Ventura County, Point Mugu

The District has received your letter dated July 7, 2003 regarding potential state and local Applicable or Relevant and Appropriate Requirements (ARARs) that may apply to Site 5 at Naval Base Ventura County, Point Mugu.

- Rule 10, “Permits Required” (for remediation equipment)
- Rule 23, “Exemptions From Permit”
- Rule 26, “New Source Review” (including BACT and emission offset requirements)
- Rule 50, “Opacity” (for dust emissions)
- Rule 51, “Nuisance” (for odors and toxic air contaminants).
- Rule 62.1, “Hazardous Materials” (for toxic air contaminants)
- Rule 74.29, “Soil Decontamination Operations” (for gasoline, diesel fuel, or jet fuel)

If you have any questions, or would like to discuss this matter in further detail, please contact me at 805/645-1421.

KZQ

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DEPARTMENT OF TRANSPORTATION

DISTRICT 7, Division of Environmental Planning

120 SO. SPRING ST.

LOS ANGELES, CA 90012-3606

PHONE (213) 897-0703

FAX (213) 897-0685

*Flex your power!
Be Energy efficient!*

August 5, 2003

Mr. Peter Chen
DTSC – Office of Military Facilities
5796 Corporation Avenue
Cypress, CA 90630

Dear Mr. Chen:

Subject: Feasibility Study at Site 5, Naval Base Ventura, Point Mugu, CA

The Site 5 at Naval Base Ventura County, Point Mugu project does not appear to have an impact on State Route 1 (PCH). However, there is a concern about chemical specific and location specific ARARs in Mugu Lagoon and Calleguas Creek. Therefore, the Department would suggest the Navy to study pesticide residue from agricultural land use in the lagoon. And also, include controls on sediment disturbance in environmentally sensitive areas during handling and disposal/cleanup.

Thank you for the opportunity to comment on the project.

Sincerely,

A handwritten signature in cursive script that reads "Ron Kosinski".

RON KOSINSKI
Deputy Director



Memorandum

To: Mr. Peter Chen
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Date: September 15, 2003

From: Patty Velez
California Department of Fish and Game
Office of Spill Prevention and Response
Resource Assessment Program
20 Lower Ragsdale Dr., Suite 100
Monterey, CA 93940

Julie Yamamoto for Patty Velez

Subject: Request of Applicable or Relevant and Appropriate Requirements (ARARs) for Feasibility Study Report for Installation Restoration (IR) Site 5 at Naval Base Ventura County, Point Mugu, California (SITE: 300113)

Introduction

The California Department of Fish and Game, Office of Spill Prevention and Response (DFG-OSPR) received your July 7, 2003 request for our Applicable or Relevant and Appropriate Requirements (ARARs) for the Feasibility Study Report for Installation Restoration (IR) Site 5 (Old 6 Area Shops), at Naval Base Ventura County, Point Mugu. These ARARs will be incorporated in the Navy's pending Feasibility Study being prepared for IR Site 5 that will develop and evaluate the appropriate remedial alternatives. The ARARs that follow are provided as part of our role as a natural resource trustee for the State of California.

Background

IR Site 5, the Old 6 Area Shops, is located at Naval Base Ventura County (NBVC) Point Mugu, about 50 miles northwest of Los Angeles. NBVC Point Mugu covers approximately 4,500 acres and supports 897 buildings. NBVC Point Mugu is a major center for testing and evaluating naval weapons systems. It also provides range, technical, and base support for fleet users and other Department of Defense agencies.

The northern half of IR Site 5 generally consists of a tidal marsh, tidal creek, and intertidal mudflat. The southern area is mostly industrialized, where chemical laboratories, along with plating, photograph developing, sand blasting and technical support shops, were formerly located. A drainage ditch and tidal creek direct surface water runoff from the east end of IR Site 5 to Mugu Lagoon (IR Site 11). Phase I and Phase II Site Inspections and a Phase I Remedial Investigation have been conducted at IR Site 5. The results from these investigations indicate that the following chemicals and impacted media are at the site:

Mr. Peter Chen
September 15, 2003
Page 2

- Metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and the pesticide, dichlorodiphenyltrichloroethane (DDT), in soil;
- Pesticides, PCBs, and metals in sediment; and
- Metals in surface water and groundwater.

Based upon preliminary Phase I RI results, an emergency removal action was conducted in June 1994 at the former plating-waste pits. Confirmation sampling indicated that the concentrations of some metals remained in the soil above the target criteria. A RI groundwater study was conducted basewide from April 1998 through March 1999 to evaluate the potential for chemicals to migrate from groundwater to surface water.

Phase II RI was conducted to fill data gaps around the former drain line and septic tank at IR Site 5 in 2002. Analytical data did not indicate the presence of VOC or metals contamination in this portion of the IR Site 5. This Phase II RI was also conducted to supplement findings from the Phase I RI with regard to attenuation of chemicals of potential ecological concern around the IR Site 5 plating-waste pits. The results of this investigation indicated that there is potential ecological risk, as determined by the Tier 1 screening-level risk assessment for aquatic life and aquatic-dependent wildlife exposure to metals in groundwater.

Comments

A list of ARARs for IR Site 5, prepared by DFG-OSPR staff and reviewed by legal counsel, is enclosed. A detailed current biological characterization of IR Site 5 should be conducted to identify habitats at the site, as well as presence of biological resources such as special-status species. If such a biological characterization/survey has already been conducted, DFG-OSPR assumes these survey results will be incorporated in the pending FS.

As the trustee for California's fish and wildlife resources, DFG-OSPR requests that these ARARs be included in the pending Feasibility Study. It is important to fully document the biological resources occurring at IR Site 5 so that consistency with DFG-OSPR's ARARs can be assessed. If sensitive habitats and/or special-status species will be affected by remedial activities, potential mitigation measures should be discussed with the appropriate natural trustee agencies. Please do not hesitate to contact me if you have any additional questions or would like to further discuss this matter. I may be reached at telephone number (831) 649-2876 or via e-mail: pvelez@ospr.dfg.ca.gov.

Enclosure

Mr. Peter Chen
September 15, 2003
Page 3

Reviewers: Wendy Johnson
Legal Counsel
Department of Fish and Game
Office of Spill Prevention and Response

Michael Martin, Ph. D.
Staff Toxicologist
Department of Fish and Game
Office of Spill Prevention and Response

cc: Julie Yamamoto, Ph. D.
Senior Toxicologist
Department of Fish and Game
Office of Spill Prevention and Response

Regina Donohoe, Ph. D.
Staff Toxicologist
Department of Fish and Game
Office of Spill Prevention and Response

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|----------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| California fish and wildlife resources | The Department of Fish and Game holds natural resources in public trust for the State of California | Fish and Game Code section 711.7 | This Code section designates the Department of Fish and Game as the trustee agency over California's fish and wildlife resources. It also concerns the payment of state filing and permit fees by person engaging in projects or activities under federal licenses, contract or permit. <i>California Public Resources Code section 10005 and section 21089</i> . This section expresses administrative policy and does not necessarily impose a substantive requirement in this situation. This section should be considered to the extent that DFG is the trustee agency over California's fish and wildlife resources. |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rare native plants | Action must be taken to conserve native plants, there can be no releases and/or actions that would have a deleterious effect on species or habitat. | Fish and Game Code section 1900 <i>et seq.</i> (Added by Stats. 1977, c. 1181, p. 3869, section 8) | <p>These code sections make provisions concerning native plants protection, including: criteria for determining endangered plant species; designation of endangered plants by the Fish and Game Commission; research by the Department; takings by the Department for scientific or propagation purposes; other prohibitions on takings; exercise of enforcement authority; arrests and confiscation; carrying out of plant conservation programs by other state departments and agencies; and unauthorized public agency regulations pertaining to agriculture. Sections 1900, 1901, 1904, 1905, 1906, 1907, 1909, 1910, 1911, 1912, and 1913 are procedural or administrative in nature and do not impose any substantive requirements.</p> <p>Section 1908 imposes a substantive requirement by forbidding any "person" to take rare or endangered native plants. Fish and Game Code section 67 provides the definition of "person" as any natural person or any partnership, corporation, limited liability company, trust, or other type of association. Whether the federal government or contractors acting on behalf of the federal government would fall within that definition is a potential issue. To the extent that there are rare or endangered plants on Point Mugu, IR Site 5, section 1908 would be an ARAR.</p> |
| Endangered Species/habitat | Criteria to be considered in Standard for Fish and Game Code section 2080 | Fish and Game Code section 2050-2068; 2070-2079 | These code sections comprise Article 1 and Article 2 of chapter 1.5 of California Endangered Species Act. These sections make declarations of policy and provide definitions, and do not impose any substantive requirements. We ask that these sections be considered to the extent that Fish and Game Code section 2080 is an ARAR (as noted below). |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Endangered Species | Action must be taken to conserve endangered species, there can be no releases and/or actions that would have a deleterious effect on species or habitat. | Fish and Game Code section 2080 (Added by Stats. 1984, c. 1240, section 2) | <p>This section prohibits the take, possession, purchase or sell within the state, any species (including rare native plant species), or any product thereof, that the commission determines to be an endangered or threatened species, or the attempt of any of these acts. This section is applicable and relevant to the extent that there are endangered or threatened species in the area which have the potential of being affected if actions are not taken to conserve the species. This section prohibits releases and/or actions that would have a deleterious effect on species or their habitat. This section and applicable Title 14 regulations should be considered as ARARs.</p> <p><i>California Code of Regulations Title 14 sections 670.2</i> provides a listing the plants of California declared to be Endangered, Threatened or Rare.</p> <p><i>California Code of Regulations Title 14 section 670.5</i> provides a listing of Animals of California declared to be endangered or threatened.</p> <p><i>California Code of Regulations Title 14 section 783 et. seq.</i>, provides the implementation regulations for the California Endangered Species Act.</p> |
| Wildlife Species | Action must be taken to prohibit the taking of birds and mammals, including the taking by poison | Fish and Game Code section 3005 (Stats. 1957, c. 456, p. 1353 section 3005) | <p>This code section prohibits the taking of birds and mammals, including taking by poison. "Take" is defined by Fish and Game Code section 86 to include killing. "Poison" is not defined in the code. Although there is no state authority on this point, federal law recognizes that poison, such as Strychnine, may effect incidental taking. (<i>Defenders of Wildlife v. Administrator, Environmental Protection Agency</i> (1989) 882. F. 2d 1295). This code section imposes a substantive, promulgated environmental protection requirement.</p> |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|---------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Birds of Prey | Action must be taken to prevent the take, possession, or destruction of any birds-of prey or their eggs | Fish and Game Code section 3503.5 (Added by Stats. 1985, c. 1334, section 6) | This section prohibits the take, possession, or destruction of any birds in the orders of Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. This section will be applicable and relevant to the extent that such species or their eggs are located on or near Point Mugu, IR Site 5. |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|--------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fully protected bird species/habitat | Action must be taken to prevent the taking of fully protected birds | Fish and Game Code section 3511 (Added by Stats. 1970, c. 1036, p. 1848 section 4) | <p>This section provides that it is unlawful to take or possess any of the following fully protected birds:</p> <ul style="list-style-type: none"> (a). American peregrine falcon (b). Brown Pelican (c). California black rail (d). California clapper rail (e). California condor (f). California least tern (g). Golden eagle (h). Greater sandhill crane (i). Light-footed clapper rail (j). Southern bald eagle (k). Trumpeter swan (l). White-tailed kite (m). Yuma clapper rail <p>This statute should be considered applicable and relevant to the extent that any of the above mentioned fully protected birds or their habitat are detected on or near Point Mugu, IR Site 5. For example, it is known that the brown pelican and the light footed clapper rail do occur at Point Mugu.</p> |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|--------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Migratory Non-game Birds | Actions must be taken to prevent the take or possession of any migratory nongame birds | Fish and Game Code section 3513 | This section prohibits the take or possession of any migratory nongame bird as designated in the Migratory Bird Treaty Act, <i>16 U.S.C. sections 3371-3378</i> ; <i>50 C.F.R. section 10.13</i> , or any part of such migratory nongame bird, except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act. This section is Applicable and Relevant, unless one of the rules and regulations adopted by the Secretary of the Interior exempt the activity and to the extent that this code section is more stringent than the Migratory Bird Act found at <i>16 U.S.C. section 3371</i> . |
| Nongame birds | Actions must be taken to prevent the take of nongame birds. | Fish and Game Code section 3800 (Added by Stats. 1971, c. 1470, p. 2906, section 13) | This section prohibits the take of nongame birds, except in accordance with regulations of the commission, or when related to mining operations with a mitigation plan approved by the department. This section further provides requirements concerning mitigation plans related to mining. This section is applicable and relevant to the extent that nongame birds or their eggs are located on or near the site and such species have not been included in the fish and wildlife conservation plan filed pursuant to the Federal Fish and Wildlife Conservation Act. Species included in the plan will be protected at the federal standard making this section an ARAR to the extent that it is more stringent than the federal standard of protection. |
| Fur-bearing mammals | Provides manners under which fur-bearing mammals may be taken | Fish and Game Code section 4000, et. Seq. (Stats. 1957, c. 456, p. 1380, section 4000) | This section provides that a fur-bearing mammal may be taken only with a trap, a firearm, bow and arrow, poison under a proper permit, or with the use of dogs. |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|-------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nongame mammals | Action must be taken to avoid the take or possession of nongame mammals | Fish and Game Code section 4150 (Added by Stats. 1971, c. 1470, p. 2907, section 21) | Nongame mammals are those occurring naturally in California which are not game mammals, fully protected mammals, or fur-bearing mammals. These mammals, or their parts, may not be taken or possessed except as provided in this code or in accordance with regulations adopted by the commission. |
| Fully Protected Mammals | Actions must be taken to assure that no fully protected mammals are taken or possessed at any time. | Fish and Game Code section 4700 (Added by Stats. 1970, c. 1036, p. 1848 section 6) | <p>This section prohibits the take or possession of any of the fully protected mammals or their parts. The following are fully protected mammals:</p> <ul style="list-style-type: none"> (a) Morro Bay kangaroo rat (b) Bighorn sheep except Nelson bighorn sheep (c) Northern elephant seal (d) Guadalupe fur seal (e) Ring-tailed cat (f) Pacific right whale (g) Salt-marsh harvest mouse (h) Southern sea otter (i) Wolverine <p>This section is applicable, relevant, and appropriate to the extent that any of these mammals and/or their habitat are located on or near Point Mugu, IR Site 5.</p> |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|-----------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fully Protected Reptiles and Amphibians | Actions must be taken to prevent the take or possession of any fully protected reptile or amphibian. | Fish and Game Code section 5050 (Added by Stats. 1970, c. 1036, p. 1849, section 7) | <p>This section prohibits the take or possession of fully protected reptiles and amphibians or parts thereof. The following are fully protected reptiles and amphibians:</p> <ul style="list-style-type: none"> (a) Blunt-nosed leopard lizard (b) San Francisco garter snake (c) Santa Cruz long-toed salamander (d) Limestone salamander (e) Black toad <p>This section should be considered to the extent that such amphibians or reptiles and/or their habitat are located on or near Point Mugu, IR Site 5.</p> |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fully Protected Fish | Actions must be taken to prevent the take or possession of any fully protected fish species. | Fish and Game Code section 5515 (Added by Stats. 1970, c. 1036, p. 1849, section 8) | <p>This section prohibits the take or possession of fully protected fish or parts thereof. The following are fully protected fish:</p> <ul style="list-style-type: none"> (a) Colorado River squawfish (b) Thicktail chub (c) Mohave chub (d) Lost River sucker (e) Modoc sucker (f) Shortnose sucker (g) Humpback sucker (h) Owens River pupfish (i) Unarmored threespine stickleback (j) Rough sculpin <p>This section is applicable, relevant and appropriate to the extent that such fish species or their habitat are located on or near Point Mugu, IR Site 5.</p> |
| Aquatic habitat/species | Action must be taken if toxic materials are placed where they can enter waters of the State. There can be no release that would have a deleterious effect on species or habitat. | Fish and Game Code section 5650 (a), (b) & (f) | <p>These code section prohibits depositing or placing where it can pass into waters of the state any petroleum products (Section 5650(a)(1)), factory refuse (section 5650(a)(4)), sawdust, shavings, slabs or edgings (section 5650(a)(3)), and any substance deleterious to fish, plant life or bird life (section 5650(a)(6)). These are substantive, promulgated environmental protection requirements. These requirements impose strict criminal liability on violators. (<i>People v. Chevron Chemical Company</i> (1983) 143 Cal. App. 3d 50). This imposition of strict criminal liability imposes a standard that is more stringent than federal law. The extent to which each subdivision of section 5650 is relevant and appropriate depends on the site characterization.</p> |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tidal Invertebrates | Action must be taken to avoid the take or possession of mollusks, crustaceans, or other invertebrates | Fish and Game Code section 8500 (Added by Stats. 1972, c. 1248, p. 2436. Section 2, eff. Dec. 13, 1972) | It is unlawful to possess or take, unless otherwise expressly permitted in this chapter, mollusks, crustaceans, or other invertebrates, unless a valid tidal invertebrate permit has been issued. The taking, possessing, or landing of such invertebrates pursuant to this section shall be subject to regulations adopted by the commission. |
| Wetlands | Actions must be taken to assure that there is "no net loss" of wetlands acreage or habitat value. Action must be taken to preserve, protect, restore and enhance California's wetland acreage and habitat values. | Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Addenda | This policy seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it opposes any development or conversion of wetland that would result in a reduction of wetland acreage or habitat value. It adopts the USFWS definition of a wetland which utilizes hydric soils, saturation or inundation, and vegetable criteria, and requires the presence of at least one of these criteria (rather than all three) in order to classify an area as a wetland. This policy is not a regulatory program and should be included as a TBC. |
| Protected Amphibians | Action must be taken to avoid the take or possession of protected amphibians. | Title 14 C.C.R. section 40 (Section 40 designated effective 03/01/74) | This regulation makes it unlawful to capture, collect, intentionally kill or injure, possess, purchase, propagate, sell, transport, import, or export any native reptile or amphibian, or parts thereof unless under special permit from the department issued pursuant to Title 14 C.C.R. sections 650, 670.7, or 783 of these regulations, or as otherwise provided in the Fish and Game Code or these regulations. To the extent that any of these amphibians are found in or near Point Mugu, IR Site 5 this section is an ARAR. |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|--------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Furbearing Mammals | Action must be taken to avoid take | Title 14 C.C.R. section 460 (effective 07/01/59) | Regulations makes it unlawful to take Fisher, marten, river otter, desert kit fox, and red fox. |
| Furbearing Mammals | Provides methods of take for other furbearing mammals not listed in Title C.C.R. section 460 | Title 14 C.C.R. section 465 (effective 07/01/69) | Furbearing mammals may be taken only with a firearm, bow and arrow, or with the use of dogs, or traps in accordance with the provisions of Section 465.5 of Title 14 and section 3003.1 of the Fish and Game Code. To the extent that any of these species are found in or near Point Mugu, IR Site 5 this section is an ARAR. |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|-----------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nongame Animals | Action must be taken to avoid the take of nongame mammals except as provided in applicable regulations | Title 14 California Code of Regulations (hereinafter referred as C.C.R.) section 472 (effective 07/01/74) | <p>This Regulation provides that nongame birds and mammals may not be taken except as provided in subsections (a) through (d) below and in sections 478 and 485.</p> <p>a). The following nongame birds and mammals may be taken except as provided in Chapter 6: English Sparrow, starling, coyote, weasels, skunks, opossum, moles and rodents (excludes tree and flying squirrels, and those listed as furbearers, endangered or threatened species);</p> <p>b). Fallow, sambar, sika, and axis deer may be taken concurrently with the general deer season.</p> <p>c). Aoudad, mouflon, tahr, and feral goats may be taken all year.</p> <p>d). American crows may be taken only under provisions of section 485 and by landowners or tenants, or person authorized by landowners or tenants, when American crows are committing or about to commit depredations upon ornamental shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. If required by Federal regulations, landowners or tenants shall obtain a Federal migratory bird depredation permit before taking any American crows or authorizing any other person to take them.</p> <p>Nongame birds and mammals including some of the species listed in subsections may be found at Point Mugu. Therefore this section is an ARAR to the extent that nongame birds and mammals are present at Point Mugu, IR Site 5.</p> |

CALIFORNIA DEPARTMENT OF FISH AND GAME
LOCATION AND ACTION SPECIFIC ARARs AND TBCs FOR POINT MUGU, IR SITE 5

| LOCATION | STANDARD | SPECIFIC CITATION | ARAR/TBC EXPLANATION |
|-----------------------------------|-----------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nongame Birds and NonGame Mammals | Methods of Take | Title 14 C.C.R. section 475 (effective 07/05/72) | This regulation provides that birds and nongame mammals may be taken in any manner except as follows: a). Poison may not be used, b). Recorded or electrically amplified bird or mammal calls or sounds or recorded or electrically amplified imitations of bird or mammal calls or sounds may not be used to take any nongame bird or nongame mammal except coyotes, bobcats, American crows and starlings, c). Traps may be used in very limited situations and d.) No feed, bait or other substance capable of attracting a nongame mammal may be used in conjunction with dogs. To the extent that any of the listed species occur on Point Mugu, IR Site 5, Title 14 C.C.R. section 475 is an ARAR. |

POTENTIAL DTSC CHEMICAL SPECIFIC ARARS
POINT MUGU SITE 5

| CHEMICAL | REQUIREMENT | CRITERIA | CITATION | ARARS DETERMINATION | COMMENTS |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hazardous Waste Control Act (HWCA) Concentration limits of regulated units effluent to groundwater, surface water, and soil | Groundwater and vadose zone protection standards: RCRA hazardous waste TSD facilities shall comply and ensure that hazardous constituents entering the groundwater, surface water, and soil from a regulated unit do not exceed the concentration limit from contaminants of concern in the uppermost aquifer underlying the waste management area beyond the point of compliance. | Hazardous waste treatment, storage, or disposal; uppermost aquifer underlying a waste management unit beyond the point of compliance. | Title 22, CCR, Div 4.5, Ch 14, §66264.94 | Relevant and Appropriate | Applicable for hazardous waste TSD facilities; potentially relevant and in site-specific circumstances, such as when the source of waste is unknown but the waste is similar in composition to listed waste or when waste constituents have released or have the potential to release to groundwater. This site is not a TSD facility, however, because contamination in groundwater or soil is similar in composition to listed waste, this requirement is determined to be relevant and appropriate. |
| Hazardous waste listing and identification | Identification of hazardous waste that poses a potential hazard to human health or the environment when it is improperly treated, stored, transported, or disposed. | Hazardous waste storage, treatment, or disposal. | Title 22, CCR, Div 4.5, Ch 11, §66261.2, §66261.3 | Applicable | Excavated soil or investigation derived waste from this site may meet the definition of hazardous waste. |
| Hazardous waste listing and identification | TCLP regulatory levels; persistent and bioaccumulative toxic substances total threshold limit concentrations (TTLIC) and soluble threshold limit concentration (STLC) | Hazardous waste storage, treatment, or disposal. | Title 22, CCR, Div 4.5, Ch 11, §66261.24 | Applicable | Using the definition of hazardous waste, groundwater from this site or potentially some spent treatment medium may exceed TCLP for some of the chemicals of concern, making it a characteristic hazardous waste. |
| Primary standards – inorganic and organic chemicals | Maximum contaminant Levels (MCLs) list for drinking water. | | Title 22, CCR, Div 4, Ch. 15, §64431, §64444 | Applicable | State MCLs for tap water standards are more stringent than primary federal standards. |

TO BE CONSIDERED STATE ADVISORIES, GUIDANCE, AND CRITERIA, CAL/EPA, DTSC

- Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities
DTSC Human and Ecological Risk Division
July 1996

2. *Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities*
DTSC Human and Ecological Risk Division
July 1992

POTENTIAL DTSC LOCATION SPECIFIC ARARS
POINT MUGU SITE 5

| LOCATION | REQUIREMENT | CRITERIA | CITATION | ARARs DETERMINATION | COMMENTS |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Within 200 feet of a fault displacement in Holocene time | New facility for treatment, storage, or disposal of hazardous waste prohibited. | RCRA and non-RCRA (California) hazardous waste; TSD facility | Title 22, CCR, Div 4.5, Ch 14, §66264.18 | Relevant and Appropriate | The locations requirements are consider relevant and appropriate for the siting of remedial systems to reduce the toxicity, volume and/or mobility of chemicals. Under RCRA, new treatment facilities shall not be located within 200 feet of a fault which has had displacement in Holocene time. |
| Within a 100-year floodplain | Facility must be designed, constructed, operated, and maintained to prevent washout by flood or maximum high tide. | RCRA and non-RCRA (California) hazardous waste; TSD facility | Title 22, CCR, Div 4.5, Ch 14, §66264.18 | Relevant and Appropriate | The locations requirements are consider relevant and appropriate for the siting of remedial systems to reduce the toxicity, volume and/or mobility of chemicals. Under RCRA, new treatment facilities shall not be affected by a 100-year flood or maximum high tide. |

TO BE CONSIDERED STATE ADVISORIES, GUIDANCE, AND CRITERIA, CAL/EPA, DTSC

1. *Drilling, Coring, Sampling and Logging at Hazardous Substance Release sites*
Guidance Manual for Ground Water Investigations
Cal/EPA, July 1995
2. *Reporting Hydrogeologic Characterization Data at Hazardous Substance Release sites*
Guidance Manual for Ground Water Investigations
Cal/EPA, July 1995
3. *Guidelines for Hydrogeologic Characterization of Hazardous Substance Release Sites, Volume 1 & 2*
Cal/EPA, July 1995
4. *Aquifer Testing for Hydrogeologic Characterization*
Guidance Manual for Ground Water Investigations
Cal/EPA, July 1995

5. *Application of Borehole Geophysics at Hazardous Substance Release Sites*
Guidance Manual for Ground Water Investigations
Cal/EPA, July 1995
6. *Ground Water Modeling for Hydrogeologic Characterization*
Guidance Manual for Ground Water Investigations
Cal/EPA, July 1995
7. *Monitoring Well Design and Construction for Hydrogeologic Characterization*
Guidance Manual for Ground Water Investigations
Cal/EPA, July 1995
8. *Advisory – Active Soil Gas Investigation*
DTSC/CRWQCB-Los Angeles Region, January 2003
9. *Representative Sampling of Ground Water for Hazardous Substances*
Cal/EPA, July 1995
10. *Accumulating Hazardous Waste at Generator Sites*
Cal/EPA, July 1995

POTENTIAL DTSC ACTION SPECIFIC ARARS
POINT MUGU SITE 5

| ACTION | REQUIREMENT | CRITERIA | CITATION | ARARs DETERMINATION | COMMENTS |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hazardous Waste Control Act (HWCA) Standards applicable to generators of hazardous waste | | | | | |
| a. Determine whether waste is a hazardous waste | Owners or operators who generate waste shall determine whether waste is a hazardous waste | Generators of hazardous waste who transport or offer hazardous waste for transportation | Title 22, CCR, Div 4.5, Ch 12, §66262.11 | Applicable | Applicable for any operation where waste is generated. The determination of whether wastes generated during remedial activities are hazardous shall be made when the wastes are generated. |
| b. Identification number for the generator | A generator shall not treat, store, dispose of, transport or offer for transportation, hazardous waste without having received an identification number. | Generators of hazardous waste who transport or offer hazardous waste for transportation | Title 22, CCR, Div 4.5, Ch 12, §66262.12 | Applicable | Same comment as before (SCAB) |
| c. Use of manifest | A generator of hazardous waste who transports or offers hazardous waste for transportation shall prepare a manifest. | Generators of hazardous waste who transport or offer hazardous waste for transportation | Title 22, CCR, Div 4.5, Ch 12, §66262.20, §66262.22 | Applicable | SCAB |
| d. Packaging, Labeling, Marking, Placarding | Before transporting hazardous waste or offering hazardous waste for transportation off-site, the generator must do the following in accordance with DOT regulations: package the waste, label and mark each package of hazardous waste, and ensure that the transport vehicle is correctly placarded. | Generators of hazardous waste who transport or offer hazardous waste for transportation | Title 22, CCR, Div 4.5, Ch 12, §66262.30, §66262.31, §66262.32, §66262.33 | Applicable | SCAB |
| e. Storage of hazardous waste on-site | Establish requirements for a generator to accumulate waste on-site for 90 days or less without a permit. | Standards for generators of hazardous waste | Title 22, CCR, Div 4.5, Ch 12, §66262.34 | Applicable | SCAB |
| f. Recording keeping and reporting | Establish requirements for record keeping of manifest, test results, waste analysis, and Biennial Report | Standards for generators of hazardous waste | Title 22, CCR, Div 4.5, Ch 12, §66262.40, §66262.41 | Applicable | SCAB |

| ACTION | REQUIREMENT | CRITERIA | CITATION | ARARS DETERMINATION | COMMENTS |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Management of hazardous waste at transfer, and TSD facilities | Establish requirements for a hazardous waste treatment facility to have a plan for waste analysis, develop a security system, conduct regular inspections, provide training to facility personnel, and use a quality assurance program during construction. | Standards for owners and operators of hazardous waste transfer and TSD facilities | Title 22, CCR, Div 4.5, Ch 14, Article 2 | Relevant and Appropriate | The requirements may be applicable if CERCLA response action constitutes treatment, storage, or disposal as defined under RCRA, or may be relevant and appropriate if the requirements address problems or situations sufficiently similar to the specific circumstances at the site that their usage will be well suited. This site is not a TSD facility, however, because contamination in groundwater or soil is similar in composition to listed waste, this requirement is determined to be relevant and appropriate. |
| Management of hazardous waste at transfer, and TSD facilities | Establish requirements for a facility to plan for emergency conditions. In addition, the design and operation of the facility must be done to prevent releases. Other requirements include testing and maintenance of equipment and incorporation of communication and alarm systems and contingency plan. | Standards for owners and operators of hazardous waste transfer and TSD facilities | Title 22, CCR, Div 4.5, Ch 14, Article 3, 4 | Relevant and Appropriate | SCAB |
| Use and management of containers | The remedial activities may involve treatment within containers and/or storage of treatment residuals in containers. These containers must be in good condition, compatible with the waste, kept closed except to add or remove materials and be inspected weekly. The area used to store the containers must provide adequate secondary containment and be designed with runoff controls. Also, appropriate closure of the containers must take place. | Standards for owners and operators of hazardous waste facilities that store or treat hazardous waste in containers. | Title 22, CCR, Div 4.5, Ch 14, Article 9 | Relevant and Appropriate | SCAB |
| Tank systems | The remedial activities may involve storage and/or treatment in tanks. These tanks are required to have secondary containment, be monitored and inspected, be provided with overfill and spill protection controls, and operated with adequate freeboard. Also, appropriate closure must take place. | Standards for owners and operators of hazardous waste facilities that store or treat hazardous waste in tanks. | Title 22, CCR, Div 4.5, Ch 14, Article 10 | Relevant and Appropriate | SCAB |

| ACTION | REQUIREMENT | CRITERIA | CITATION | ARARs DETERMINATION | COMMENTS |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waste piles | The waste piles should be placed upon a lined foundation or base with a leachate system, protected from precipitation and wind dispersal, designed to prevent run on and run off. Also, closure and post-closure care requirements. | Standards for owners and operators of hazardous waste facilities that store or treat hazardous waste in waste piles. | Title 22, CCR, Div 4.5, Ch 14, Article 12 | Relevant and Appropriate | Remedial action may involve soil excavation and the compiling of soil in a temporary waste pile. |
| Miscellaneous units | Applies to waste management unit not otherwise regulated under RCRA. It may include pumps, auxiliary equipment, air strippers, etc. The substantive requirements include design, construction, operation, maintenance and closure of the unit that will ensure protection of human health and the environment. The actions include general inspections for safety and operation efficiency, testing and maintenance of the equipment (including testing of warning systems). | Standards for owners and operators of hazardous waste facilities that store or treat hazardous waste in miscellaneous units. | Title 22, CCR, Div 4.5, Ch 14, Article 16 | Relevant and Appropriate | Remedial activities may involve the use of pumps, auxiliary equipment, air strippers, etc. |
| Land Disposal Restrictions (LDR) for RCRA wastes and non-RCRA wastes | Movement of hazardous waste to new locations and placed in or on land will trigger LDR. General applicability, dilution prohibited, waste analysis and record keeping, and special rules apply for wastes that exhibit a characteristic waste. Best Demonstrated Available Technology (BDA) standards for each hazardous constituents in each listed waste, if residual is to be disposed. Treatment standards table when necessary. | Defines hazardous wastes that are restricted from land disposal and prohibited waste that may be land disposed | Title 22, CCR, Div 4.5, Ch 18, Article 1, 3, 4, 10, 11 | Applicable | Where applicable, hazardous waste generated from remedial activities must comply with LDR and meet or notify the disposal facility of the treatment standards before disposal at an appropriate offsite disposal facility. |
| Closure and post-closure care | Owners and operators shall close a facility and perform post-closure care when contaminated subsurface soil cannot be practically removed or decontaminated. | Waste residues, contaminated containment system components, contaminated soil, and structures and equipment left in place at final closure triggers post-closure care requirements when clean closure is not achieved. | Title 22, CCR, Div 4.5, Ch 14, §66264.111, §66264.112, §66264.115 through 120 | Relevant and Appropriate | Contaminated soil, residues, or groundwater from remedial action at a site will achieve clean closure, otherwise, post-closure care requirements will be relevant and appropriate. |
| Groundwater monitoring and response | Owners or operators of a RCRA surface impoundment, waste pile, land treatment unit, or landfill shall conduct a monitoring and response program for each regulated unit. | Constituents in or derived from the units may pose a threat to human health or the environment. | Title 22, CCR, Div 4.5, Ch 14, §66264.91 (a) and (c) | Relevant and Appropriate | Substantive technical requirements are potentially relevant and appropriate for remedial action including groundwater monitoring. |

| ACTION | REQUIREMENT | CRITERIA | CITATION | ARARs DETERMINATION | COMMENTS |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitoring | Requirements for monitoring groundwater, surface water, and vadose zone. | RCRA hazardous waste TSD facilities | Title 22, CCR, Div 4.5, Ch 14, §666264.97 (b), (c), (d) and (e)(1) through (e)(5) | Relevant and Appropriate | SCAB |
| Containment and detection of releases | In order to prevent release of hazardous constituents to the environment, tank systems, including ancillary equipment, shall have secondary containment (e.g., double-wall piping). | RCRA hazardous waste TSD facilities | Title 22, CCR, Div 4.5, Ch 14, §666264.193 (b) and (c) | Relevant and Appropriate | Potentially applicable to some portion of the remedial system. |
| Detection monitoring | Requires the owner or operator of a regulated unit to develop a detection monitoring program that will provide reliable indication of a release. | RCRA hazardous waste TSD facilities | Title 22, CCR, Div 4.5, Ch 14, §666264.98 | Relevant and Appropriate | SCAB |
| Evaluation monitoring | Requires the owner or operator of a regulated unit to develop an evaluation monitoring program that can be used to assess the nature and extent of a release from the unit. | RCRA hazardous waste TSD facilities | Title 22, CCR, Div 4.5, Ch 14, §666264.99 | Relevant and Appropriate | SCAB |
| Corrective action | The owner or operator is required to take corrective action under Title 22, CCR, §66264.91 to remediate releases from the regulated unit and to ensure that the regulated unit achieves compliance with the water quality protection standard. | RCRA hazardous waste TSD facilities | Title 22, CCR, Div 4.5, Ch 14, §666264.100 (a) through (d), (f), (g)(1), and (h) | Relevant and Appropriate | SCAB |
| Institutional Controls | Allows DTSC to enter into an agreement with the owner of a hazardous waste facility to restrict present and future land usages. Provides a streamlined process to be used for entering into an agreement to restrict specific usage of property in order to implement land-use restrictions | Transfer of property from a federal agency to a non-federal agency | Cal. Health and Safety Code, §25202.5, 25222.1 Cal. Civil Code, §1471 | Relevant and Appropriate | The substantive provisions of Cal. Health and Safety Code (HSC), §25202.5 are the general narrative standards to restrict "[p]resent and future uses of all or part of the land on which the ... facility ... is located ..." HSC §25222.1 provides the authority for the state to enter into voluntary agreement to establish land-use covenants with the owner of the property. The substantive provision of this section is the general narrative standard "[r]estricting specified uses of the property". Cal. Civil Code §1471 provides conditions under which land-use restrictions will apply to successive owners of land. |

TO BE CONSIDERED STATE ADVISORIES, GUIDANCE, AND CRITERIA, CAL/EPA, DTSC

1. *Institutional Control Protocol at Open Bases*
California Military Environmental Coordination Committee (CMECC)
Site Cleanup Performance Action Team
January 5, 1998

ATTACHMENT A3

**LETTER OF NOVEMBER 15, 2002
FROM RWQCB TO NAVY
REGARDING GROUNDWATER
BENEFICIAL USE DESIGNATION
AT NAS POINT MUGU**



Winston H. Hickox
Secretary for
Environmental
Protection

California Regional Water Quality Control Board Los Angeles Region

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Governor

2002 NOV 18 AM 11:47

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November 15, 2002

Mr. Michael Gonzales, Remedial Project Manager
Department of the Navy, Southwest Division – Naval Facility Engineering Command
1220 Pacific Highway
San Diego, CA 92132-5190

RESPONSE TO NAVY'S COMMENTS, EVALUATION OF GROUNDWATER BENEFICIAL USE DESIGNATIONS AT NAVAL BASE VENTURA COUNTY, POINT MUGU FACILITY POINT MUGU, CALIFORNIA (SLIC NO. 282)

Dear Mr. Gonzales:

Los Angeles Regional Water Quality Control Board (Regional Board) staff have reviewed your August 27, 2002 memorandum. Your memorandum was provided in response to the Regional Board's June 21, 2002, response to your April 2002 document titled, *Technical Memorandum, Evaluation of Groundwater Beneficial Use Designations at Naval Base Ventura County, Point Mugu Facility, Point Mugu, California*.

This letter is to inform you that we will pursue a basin plan amendment for the dedesignation of the Municipal and Domestic Supply beneficial use for the semi-perched aquifer under Naval Base Ventura County, Point Mugu Facility. We do not plan to evaluate the Agricultural designation of the aquifer, due to the fact that the semi-perched aquifer appears to be in hydraulic continuity with aquifers under agricultural use landward of your facility. Evidence for the hydraulic continuity includes the apparent landward movement of seawater into the semi-perched aquifer beneath the base. As the semi-perched aquifer is not used for municipal or domestic supply at your base, the landward movement of seawater must therefore result from inland agricultural pumping.

Please note that if the Municipal and Domestic Supply designation is removed from the semi-perched aquifer, it will not alleviate you of the responsibility to clean up contamination resulting from past spills or leaks from your operations. You should expect that the goal of the clean up for naturally occurring pollutants will be to achieve naturally occurring background levels and for man-made pollutants (including most volatile organic compounds) will be to achieve non-detectable levels.

To notify us of your wish to proceed or if you have any questions, please contact Renee DeShazo (213-576-5683) or Peter Raftery (213-576-6724).

Sincerely,

Dennis A. Dickerson
Executive Officer

cc: Robert Sams, Office of the Chief Counsel, State Water Resources Control Board
Mr. Quang Than, DTSC, Region 4, Office of Military Services, 5796 Corporate Avenue, Cypress, CA 90630

California Environmental Protection Agency

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption

For a list of simple ways to reduce demand and cut your energy costs, see the tips at: <http://www.swrcb.ca.gov/news/echallenge.html>



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Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

Appendix B
Cost Estimates for Removal Action Alternatives

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ACRONYMS AND ABBREVIATIONS

| | |
|-------|------------------------------------------------|
| AOEC | area of ecological concern |
| COC | chemical of concern |
| EE/CA | engineering evaluation/cost analysis |
| EPA | Environmental Protection Agency, United States |
| IRP | Installation Restoration Program |
| O&M | operation and maintenance |
| RACER | Remedial Action Cost Engineering Requirements |
| UPB | Unit Price Book |

B1. INTRODUCTION

This appendix presents a cost backup including underlying assumptions and quantities for cost estimates, and an individual cost summary for each removal action alternative considered for detailed evaluation in this Engineering Evaluation/Cost Analysis (EE/CA) Report. The cost estimates were generated for removal action alternatives based on the conceptual design conducted using the available site characterization information for the Installation Restoration Program (IRP) Site 5. The cost estimates generated in this EE/CA are for comparison purposes only and are of sufficient level of accuracy to conduct comparative analysis of removal action alternatives based on costs.

Following tools were extensively used in developing the cost estimate in support of this EE/CA:

- Remedial Action Cost Engineering Requirements (RACER TM 2007) system Version 9.1.0.
- A Guide to Developing and Documenting Cost Estimates During the Feasibility Study (EPA 2000).

The general methodology for cost estimation, individual cost summaries for removal action alternatives, and underlying assumptions for cost estimates are presented in the following sections.

B2. GENERAL METHODOLOGY FOR COST ESTIMATION

In general, the methodology used for cost estimation included the following:

- Identification of cost element structure for each removal action alternative. The cost element structure identifies different categories of costs (capital and/or operation and maintenance [O&M]) and associated cost elements (e.g. excavation and off-site disposal).
- Estimation of quantities for cost estimation based on the available site characterization information.
- Identification of RACER technology model associated with each identified cost element. Where exact technology model was not available in RACER for a particular cost element, a technology model sufficiently similar to cost element was used. When the RACER technology model was used for cost estimation, RACER 2007 default mark-up template was used to calculate marked-up costs. Marked-up costs include contractor overhead and profit.
- For the cost elements, where neither an exact match nor a sufficiently similar technology model was available in RACER (e.g. excavation), budgetary estimates and quotes from vendors were used and the RACER 2007 default mark-up template was used to calculate marked-up costs.

Following estimation of costs for each removal action alternative, a present value analysis was conducted to allow for cost comparisons of different removal action alternatives on the basis of single cost figure for each alternative. This single number referred to as the present value, is the amount needed to be set aside at the initial point in time (base year) to assure that funds will be available in the future as they are needed, assuming certain economic conditions (EPA 2000). The present value of future payments was calculated using the following formula:

$$PV = \frac{x_t}{(1 + i)^t}$$

where:

PV = present value

x_t = payment in year t (t = 0 for base year)

i = discount rate

The following assumptions were used in the present value analysis:

- Base year of 2009.
- Removal action design costs assumed to be incurred in 2009.
- Removal action implementation starts in January 2010.
- A report documenting removal action activities and results is prepared in 2010.
- The period of analysis for present value calculation is the period of time over which present value is calculated. For removal actions alternatives considered in this EE/CA,

the period of analysis was assumed to be equivalent to project duration beginning in the base year (2009) and continuing through the planning, design, construction, and preparation of report documenting removal action activities.

- Real discount rates as presented in the January 2008 revision of Appendix C of the Office of Management and Budget (OMB) Circular A-94 (OMB 2008) (hereafter referred to as OMB Circular A-94) were used for present value analysis. The EPA guidance (EPA 2000) recommends that the same discount rate should be used for all removal alternatives even if the period of analysis varies from one to another. Therefore, even though the period of analysis of Alternative 2 is 30 years, and for Alternative 3 is 2 years, a discount rate equal to all other removal alternatives of 2.8 percent was used for present value analysis.
- These cost estimates generated in 2007 as part of Draft EE/CA report were escalated to year 2009 using an escalation index of 1.0394. The escalation index was obtained from the Naval Center for Cost Analysis Inflation Calculator for Fiscal Year 09 Budget, Ver. 1, (January 2008).

B3. ASSUMPTIONS AND COSTS FOR REMOVAL ACTION ALTERNATIVES

The underlying assumptions and quantities for cost estimates and individual cost summaries for removal action alternatives considered in this EE/CA are presented in the following sections.

B3.1 ALTERNATIVE 2: INSTITUTIONAL CONTROLS

Under Alternative 2, institutional controls would be designed and put in place to restrict site use and the uncontrolled disturbance and release of the chemical of concern (COC)-impacted sediment of area of ecological concern (AOEC) 1. The COC-impacted sediment of AOEC 1 would remain in place. No removal measures would be implemented to reduce concentrations of COCs in the sediment, or alter transport/exposure pathways to birds and small mammals.

The estimated costs for Alternative 2 are presented in Table B3-1. Table B3-2 presents the assumptions and parameters used for Alternative 2 cost estimate.

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Table B3-1: Estimated Costs for Alternative 2

| Cost Element ^{a, b, c} | Institutional Controls (Capital) | Five-Year Reviews Periodic (Capital) | Inspections/ Reports | Sub-Total (2007 Costs) | Escalation Factor | Sub-Total (2009 Costs) | Discount Factor ^d | Present Value |
|---------------------------------|----------------------------------|--------------------------------------|----------------------|------------------------|-------------------|------------------------|------------------------------|---------------|
| Calendar Year 1 2010 | \$50,000 | | \$37,000 | \$87,000 | 1.0394 | \$90,428 | 0.973 | \$87,965 |
| Calendar Year 2 2011 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.946 | \$36,391 |
| Calendar Year 3 2012 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.920 | \$35,400 |
| Calendar Year 4 2013 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.895 | \$34,436 |
| Calendar Year 5 2014 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.871 | \$33,498 |
| Calendar Year 6 2015 | | \$25,000 | \$37,000 | \$62,000 | 1.0394 | \$64,443 | 0.847 | \$54,603 |
| Calendar Year 7 2016 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.824 | \$31,698 |
| Calendar Year 8 2017 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.802 | \$30,835 |
| Calendar Year 9 2018 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.780 | \$29,995 |
| Calendar Year 10 2019 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.759 | \$29,178 |
| Calendar Year 11 2020 | | \$25,000 | \$37,000 | \$62,000 | 1.0394 | \$64,443 | 0.738 | \$47,561 |
| Calendar Year 12 2021 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.718 | \$27,610 |
| Calendar Year 13 2022 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.698 | \$26,858 |
| Calendar Year 14 2023 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.679 | \$26,126 |
| Calendar Year 15 2024 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.661 | \$25,415 |
| Calendar Year 16 2025 | | \$25,000 | \$37,000 | \$62,000 | 1.0394 | \$64,443 | 0.643 | \$41,427 |
| Calendar Year 17 2026 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.625 | \$24,049 |
| Calendar Year 18 2027 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.608 | \$23,394 |
| Calendar Year 19 2028 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.592 | \$22,757 |
| Calendar Year 20 2029 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.576 | \$22,137 |
| Calendar Year 21 2030 | | \$25,000 | \$37,000 | \$62,000 | 1.0394 | \$64,443 | 0.560 | \$36,084 |
| Calendar Year 22 2031 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.545 | \$20,948 |
| Calendar Year 23 2032 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.530 | \$20,377 |
| Calendar Year 24 2033 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.515 | \$19,822 |
| Calendar Year 25 2034 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.501 | \$19,282 |
| Calendar Year 26 2035 | | \$25,000 | \$37,000 | \$62,000 | 1.0394 | \$64,443 | 0.488 | \$31,431 |
| Calendar Year 27 2036 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.474 | \$18,246 |
| Calendar Year 28 2037 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.462 | \$17,749 |
| Calendar Year 29 2038 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.449 | \$17,266 |

| Cost Element^{a, b, c} | Institutional Controls (Capital) | Five-Year Reviews Periodic (Capital) | Inspections/ Reports | Sub-Total (2007 Costs) | Escalation Factor | Sub-Total (2009 Costs) | Discount Factor^d | Present Value |
|----------------------------------------|-----------------------------------------|---------------------------------------------|-----------------------------|-------------------------------|--------------------------|-------------------------------|------------------------------------|------------------------------|
| Calendar Year 30 2039 | | | \$37,000 | \$37,000 | 1.0394 | \$38,458 | 0.437 | \$16,795 |
| Calendar Year 31 2040 | | \$25,000 | \$37,000 | \$62,000 | 1.0394 | \$64,443 | 0.425 | \$27,377 |
| | | | | | | | | |
| Total Present Value^e | | | | | | | | \$937,000^e |

Notes:

^a The costs are rounded of to nearest thousands.

^b The costs include contractor markups, or overhead and profit. RACER 2007 Markup Template was used to calculate Marked-up Cost.

^c The costs for professional labor are included in the estimate.

^d Discount factor was calculated using a real discount rate of 2.8 percent per the Office of Management and Budget (OMB) Circular A-94 (OMB 2008).

^e The value reflects present worth as of 2009 rounded to nearest thousand.

Table B3-2: Assumptions / Parameters for Cost Estimation of Alternative 2: Institutional Controls

| Cost Element | Key Assumptions / Parameters |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAPITAL COSTS | |
| Institutional Controls Implementation | <ol style="list-style-type: none"> 1. RACER Technology Model Used: Munitions and Explosives of Concern (MEC) Institutional Controls 2. Tasks: Planning, implementation, training and follow-up, quality support visits 3. Site distance: 30 miles 4. Site complexity: Low |
| PERIODIC COSTS | |
| Five-Year Reviews | <ol style="list-style-type: none"> 1. RACER Technology Model Used = Five-year review 2. Number of reviews = 6 3. Tasks included = Document review, interviews, site inspection, and reports. |
| OPERATION AND MAINTENANCE COSTS | |
| Inspections/Reporting | <ol style="list-style-type: none"> 1. Tasks: Inspections and Reporting 2. Frequency: Quarterly |

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B3.2 ALTERNATIVE 3: EXCAVATION OF SEDIMENT WITH OFF-SITE TREATMENT AND DISPOSAL

Alternative 3 would involve excavation of COC-impacted sediment at IRP Site 5, dewatering and chemical profiling of the excavated sediment, loading and transporting the impacted sediment off-site, and backfilling the excavation. The action represents an interim solution to the problem of contaminated sediment at the site. A permanent solution may be conducted at a later date if residual risks are above the final goals for the site.

The excavated sediment would be temporarily stored in staging piles as for dewatering. Chemical profiling will be conducted for the dewatered sediment and the water generated as a result of sediment dewatering. Dewatered sediment will be loaded into trucks to be transported and disposed of at an approved disposal facility. The water generated as a result of sediment dewatering, if necessary, will be sent to an approved disposal facility. Following excavation, confirmation sampling would be conducted for cadmium, chromium, copper, nickel, lead, and silver to ensure that target cleanup goals based on removal action objectives are attained and are protective of birds and small mammals. Excavated areas would then be backfilled with clean sediment and compacted. Advice for the reconstitution of the salt marsh will be solicited from the California Department of Fish and Game. Surficial portions of the backfill would be designed and constructed with materials similar to the physical composition of the surrounding sediment bed, with the intent that the salt marsh ecological community would recolonize the backfill surface.

The estimated costs for Alternative 3 are presented in Table B3-3. Table B3-4 presents the assumptions and parameters used for Alternative 3 cost estimate.

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B3-8

Table B3-3: Estimated Costs for Alternative 3

| Cost Element^{a, b, c} | Calendar Year 1 2009 | Calendar Year 2 2010 | Row Total |
|-----------------------------------------------------|-------------------------------------|-------------------------------------|----------------------|
| Removal Action Design | \$84,000 | | \$84,000 |
| Excavation and Backfill (Capital) | | \$304,000 | \$304,000 |
| Confirmation Sampling (Capital) | | \$13,000 | \$13,000 |
| Backfill Sampling (Capital) | | \$24,000 | \$24,000 |
| Chemical Profiling of Stockpiled Sediment (Capital) | | \$5,000 | \$5,000 |
| Dewatering (Capital) | | \$92,000 | \$92,000 |
| Off-Site Disposal (Capital) | | \$534,000 | \$534,000 |
| Removal Action Report (Capital) | | \$79,000 | \$79,000 |
| | | | |
| Sub-Total (2007 Costs) | \$84,000 | \$1,051,000 | \$1,135,000 |
| Escalation Factor | 1.0394 | 1.0394 | |
| Sub-Total (2009 Costs) | \$87,310 | \$1,092,409 | \$1,179,719 |
| Contingency (20 percent) | \$17,462 | \$218,482 | \$235,944 |
| Sub-Total (2009 Costs with Contingency) | \$104,772 | \$1,310,891 | \$1,415,663 |
| Discount Factor^d | 0.973 | 0.946 | |
| Present Value^e | \$101,943 | \$1,240,103 | \$1,342,000 |

Notes:

^a The costs are rounded of to nearest thousands.

^b The costs include contractor markups, or overhead and profit. RACER 2007 Markup Template was used to calculate Marked-up Cost.

^c The costs for professional labor are included in the estimate.

^d Discount factor was calculated using a real discount rate of 2.8 percent per the Office of Management and Budget (OMB) Circular A-94 (OMB 2008).

^e The value reflects present worth as of 2009.

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B3-10

Table B3-4: Assumptions / Parameters for Cost Estimation of Alternative 3: Excavation of Sediment with Off-Site Treatment and Disposal

| Cost Element | Key Assumptions / Parameters |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAPITAL COSTS | |
| Excavation and Backfill | <ol style="list-style-type: none"> 1. Source of cost data: RACER and Vendor quote/budgetary estimate. 2. Estimated volume of contaminated sediment to be excavated = 2,700 bank cubic yards |
| Dewatering | <ol style="list-style-type: none"> 1. Source of cost data: RACER and Vendor quote/budgetary estimate. 2. Includes cost of a concrete containment pad and treatment of pumped water through a GAC 3. Estimated volume of sediment to be dewatered: 3,400 cy (assuming a fluff factor of 1.25) 4. No of water samples generated as a result of dewatering to be analyzed: 20 5. Analytes Assumed: Metals and VOCs |
| Chemical Profiling of Stockpiled Sediment | <ol style="list-style-type: none"> 1. Source of cost data: RACER and Vendor quote/budgetary estimate. 2. No of sediment samples to be analyzed: 14. 3. Analyses Assumed: Metals. |
| Off-Site Disposal | <ol style="list-style-type: none"> 1. Source of cost data: RACER and Vendor quote/budgetary estimate 2. Unit Cost for off-site transportation and disposal of RCRA hazardous waste requiring stabilization: \$114 per ton 3. Unit cost for off-site transportation and disposal of non-hazardous sediment: \$53.4 per ton 4. Estimated weight of sediment requiring off-site disposal: 4,556 tons 5. Cost is based on the characterization of 15 percent of waste as RCRA hazardous and 85 per cent as non-hazardous. |
| Confirmation Sampling | <ol style="list-style-type: none"> 1. Source of cost data: RACER and Vendor quote/budgetary estimate 2. Number of confirmation samples: 30 (includes samples collected for quality assurance/quality control [QA/QC]) 3. Analyses assumed: Metals |
| Backfill Sampling | <ol style="list-style-type: none"> 1. Source of cost data: RACER and Vendor quote/budgetary estimate 2. Number of backfill samples: 10 (includes samples collected for QA/QC) 3. Analyses assumed: VOCs, SVOCs, Metals PAHs, pH, Pesticides, PCBs, Chlorinated herbicides, and TPH |

B4. REFERENCES

Environmental Protection Agency, United States (EPA). 2000. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*. OSWER Directive 9355.0-75. EPA 540-R-00-002. July.

Office of Management and Budget (OMB). 2008. *OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, Appendix C: Discount Rates for Cost-Effectiveness, Lease Purchase, and Related Analyses*.
http://www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html. January.

Remedial Action Cost Engineering Requirements System (RACER TM 2007). Version 9.1.0. Software Help Menu.

Appendix C
Responses to Regulatory Agency Comments

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: John P. Christopher, Ph.D., Staff Toxicologist, California Department of Toxic Substances Control, Human and Ecological Risk Division, Letter dated 4 February 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-----------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Comments | | | |
| 1. | Overall | The Focused Feasibility Study and Engineering Evaluation/Cost Analysis (EE/CA) are acceptable for purposes of protection of humans and other species. In particular, applying the Remedial Action Objectives as "not to exceed" values, as stated in the EE/CA, should insure that post-remediation exposures for the California light-footed clapper rail will be low enough to be protective given the USEPA Region 9 Biological Technical Assistance Group's current efforts at deriving a new Toxicity Reference Value for cadmium. | Comment Noted. The EE/CA has been revised to incorporate the revised sediment management objectives based on the 95 percent upper confidence limit of the mean, which were approved during the 4/17/08 conference call with DTSC and DFG-OSPR, and are discussed in the "Final Focused Feasibility Study Report for Wetlands Sediment, IR Site 5, Naval Base Ventura County Point Mugu, Point Mugu, California" issued by Bechtel Environmental Inc. in July 2008. |
| 2. | Endpoints for Toxicity Reference Values (TRV) | <p>This comment is for the Navy's information; no response is required. The Biological Technical Assistance Group (BTAG) of USEPA Region 9 has published recommended TRVs for Cd but not Cr in birds (DTSC, 2002). In Appendix D to the Focused Feasibility Study, the Navy develops their own minimum and maximum TRVs for these metals. Although the Navy has departed in two important ways from the methods used by the Region 9 BTAG for developing TRVs, we find that we can work with the values they recommend, as described in the Specific Comments below.</p> <p>The first departure is limiting the choice of candidate toxic endpoints to growth and reproduction, whereas BTAG has recommended for many years that all endpoints of systemic toxicity should be considered. This is the usual practice for Reference Doses and Reference Concentrations published by USEPA to protect humans. BTAG finds an expanded suite of endpoints especially necessary when trying to protect threatened or endangered species such as the California light-footed clapper rail.</p> <p>The second departure is the Navy's choice of Lowest Observed Adverse Effect Level (LOAEL) and No Observed Adverse Effect Level (NOAEL) for their minimum and maximum TRVs. BTAG's TRV-Low and the Navy's minimum TRV make similar use of the highest bounded NOAEL (except for the difference in spectrum of toxic endpoints). The Navy selected their maximum TRV based on the lowest LOAEL higher than the highest NOAEL, which led to the minimum and maximum TRVs falling quite close together. BTAG selected a TRV-High to estimate a likely effects level in most species, with the specific intention of separating TRV-Low and TRV-High enough to present two distinct options for risk assessment and risk management.</p> | Comment Noted. |
| Specific Comments B – EE/CA | | | |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: John P. Christopher, Ph.D., Staff Toxicologist, California Department of Toxic Substances Control, Human and Ecological Risk Division, Letter dated 4 February 2008.

| Comment No. | Section/Page No. | Comment | Response |
|----------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6. | Regulatory Agencies, Sec. 1, p. 1-1 | Please include the California Department of Fish & Game among the agencies and trustees with which the Navy is cooperating on cleanup of Site 5. | The text has been revised to reflect that the DON will work in coordination with the California Department of Fish and Game through the DTSC to implement this action. |
| 7. | Justification of Removal, Sec. 2.6, p. 2-31: | We concur with the Navy that removal of soils and sediments with elevated concentrations of Cd and Cr is justified for protection of the California light-footed clapper rail. | Comment Noted. |
| 8. | Removal Action Objectives (RAO), Sec. 3-3, p. 3-1: | The RAO for Cd and Cr are set equal to the SMO. We recommend that DTSC approve the RAO as stated in this section, with one minor modification. Change "sediment containing cadmium <u>and</u> chromium" and "above 17.5 mg/kg <u>and</u> 172 mg/kg chromium" to "cadmium <u>or</u> chromium" and "above 17.5 mg/kg <u>or</u> 172 mg/kg chromium". | The removal action objectives have been updated as per the sediment management objective levels from the Final FS (BEI 2008) and as provided below: "Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment". |
| 9. | Recommended Alternative, Sec. 5, p. 5-1 | We concur with the Navy's recommendation to proceed with Alternative 3, excavation, off-site disposal, and clean back-fill, as the only one of the three candidate alternatives which provides any real protection for the California light-footed clapper rail. | Comment Noted. |
| Conclusions and Recommendations | | | |
| 1. | | Although the Navy has incorrectly limited the toxic endpoints on which to base Toxicity Reference Values, we find we can work the values proposed for Cd and Cr at Site 5 as a site-specific conclusion. | Comment Noted. See Response to General Comment No. 1. |
| 2. | | The Remedial Action Objectives of 17.5 for Cd and 172 for Cr are acceptable, provided all sediments found with higher concentrations of either of these two metals are removed. Applying the Remedial Action Objectives in this manner should result in sediment concentrations well below the Sediment Management Objectives derived in the Focused Feasibility Study. | Comment Noted. See Response to Comment No. 1. In addition, the implementation of Alternative 3 is expected to result in the residual concentrations (95% UCL) of COCs at IRP Site 5 below the revised approved sediment management objectives and also within or below the established Mugu Lagoon reference values. |
| 3. | | The Focused Feasibility Study and the EE/CA for Site 5 are both acceptable with respect to protection of humans and other species. | Comment Noted. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Regina Donohoe, Ph.D., Staff Toxicologist, California Department of Fish and Game, Letter dated 4 March 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specific Comments | | | |
| 1. | Section 2, Site Characterization | The text in this section is essentially the same as presented in the Draft FS for Installation Restoration Site 5. Our comments on this section, outlined in our February 8, 2007 memorandum, continue to apply to this document and are not repeated herein. As we noted in our February 8, 2007 memorandum, DFG-OSPR has concerns regarding the maximum remaining levels of copper (2,080 mg/kg), nickel (1,000 mg/kg), lead (not listed) and silver (159 mg/kg) in soil adjacent to the plating pits, in addition to the elevated chromium and cadmium levels. DFG-OSPR recommends that all metals be analyzed in post-remediation confirmation samples to ensure that levels remaining are protective of wetland species. Sediment management objectives (SMOs) for these metals should be developed to protect the types of habitat and receptors that will potentially occur at Site 5 following remediation. These SMOs should include protection of small mammals that may use the restored area. | <p>The EE/CA has been revised to incorporate the revised sediment management objectives based on the 95 percent upper confidence limit of the mean, that were approved during the 4/17/08 conference call with DTSC and DFG-OSPR, and are discussed in the "Final Focused Feasibility Study Report for Wetlands Sediment, IR Site 5, Naval Base Ventura County Point Mugu, Point Mugu, California" issued by Bechtel Environmental Inc. in July 2008.</p> <p>The EE/CA has been revised to indicate that the confirmation samples will be analyzed for copper, nickel, lead, and silver in addition to cadmium and chromium and that the revised sediment management objectives for IRP Site 5 are protective of birds and small mammals.</p> |
| 2. | Section 2.2.7, Ecological Characterization | It is stated the descriptions of the habitats (i.e., salt marsh, tidal creek channels and intertidal mudflats) found at Site 5, north of Beach Road, are "provided below." Please provide this information as it was omitted from the document. | The text has been revised to reflect this information. |
| 3. | Section 3.3, Remedial Action Objectives (RAOs). | RAOs of 17.5 mg/kg for cadmium and 172 mg/kg for chromium in Site 5 wetland sediment are proposed in the EE/CA. As stated in our February 8, 2007 memorandum, DFG-OSPR does not concur with the selection of the avian toxicity reference values (TRVs) used to develop the RAOs for cadmium and chromium at Site 5. | The EE/CA has been revised to incorporate the revised sediment management objectives based on the 95 percent upper confidence limit of the mean, which were approved during the 4/17/08 conference call with DTSC and DFG-OSPR, and are discussed in the Final FS (BEI 2008). |
| a. | Cadmium | For cadmium, we previously recommended that the SMO should be between local ambient levels (1.9 mg/kg) and the lowest observed adverse effect level (LOAEL) TRV-based concentrations for the Clapper Rail (9 mg/kg). In a February 4, 2008 memorandum to Peter Chen, DTSC, John Christopher, DTSC, recommended a RAO of 6.1 mg/kg, but was willing to accept 17.5 mg/kg as a "not to exceed" value. DFG-OSPR is willing to accept the 17.5 mg/kg as an interim "not to exceed" RAO but would prefer that the proposed remedial action strive to achieve a 95% upper confidence limit (UCL) on the mean concentration of less than 6 mg/kg for IRP Site 5, for the protection of the Clapper Rail. As requested, it should be verified that this RAO is also protective of small mammals. | As stated in Response to Comment No.3, the revised sediment management objectives for IRP Site 5 have been developed and approved. The revised sediment management objective value for cadmium is 7.56 mg/kg and is protective of birds and small mammals. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Regina Donohoe, Ph.D., Staff Toxicologist, California Department of Fish and Game, Letter dated 4 March 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| b. | Chromium | As stated in a November 20, 2006 memorandum from DF G-OSPR to DTSC, we recommend that the geometric mean of growth and reproduction no observed adverse effect levels (NOAELs; 2.66 mg/kg/d), selected as the TRV by U.S. EPA (U.S. EPA, 2005), be utilized to develop the SMO. Utilizing this TRV and the exposure factors presented in Appendix D, Section D3.2, of the Draft FS (Bechtel Environmental, Inc., 2006), the SMO would be 117 mg/kg for the Clapper Rail and the Song Sparrow. In a February 4, 2008 memorandum to Peter Chen, DTSC, John Christopher, DTSC, was willing to accept 172 mg/kg as a "not to exceed" value. DFG-OSPR is willing to accept the 172 mg/kg as an interim "not to exceed" RAO but would prefer that the proposed remedial action strive to achieve a 95% UCL on the mean concentration of less than 117 mg/kg for IRP Site 5, for the protection of the Clapper Rail. As requested, it should be verified that this RAO is also protective of small mammals. | As stated in Response to Comment No.3, the revised sediment management objectives for IRP Site 5 have been developed and approved. The revised sediment management objective value for chromium is 115 mg/kg and is protective of birds and small mammals. |
| c. | | Please change the text to indicate that the interim RAOs would be 17.5 mg/kg for cadmium or 172 mg/kg for chromium. While we understand that the DoN considers the EE/CA remediation to be an interim removal action, DFG-OSPR believes that with some additional evaluation to ensure that these "not to exceed" RAOs are protective for all metals and wetland receptors, additional remediation may not be required, expediting site closure. | The removal action objectives have been updated as per the sediment management objective levels from the Final FS (BEI 2008) and as provided below: "Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment". |
| 4. | Section 3.5 and Appendix A, Applicable or Relevant and Appropriate Requirements (ARARs) | For the Draft FS (Bechtel Environmental, Inc., 2006), Wendy Johnson, DFG-OSPR Staff Counsel, provided comments on the ARARs presented in Section 3, in a February 8, 2007 memorandum to Peter Chen, DTSC. It appears that some, but not all (e.g., DF G Code 1908, 3511 and 8500) of these concerns were addressed in the EE/CA. DFG-OSPR requests that the DoN provide responses to the comments provided in the February 8, 2007 memorandum before we provide additional comments on ARAR selection. | The Navy provided responses to comments from Wendy Johnson in Appendix E of the Final FS (BEI 2008) on California Fish and Game Code Sections 2080, 1908, 3005, 3503.5, 3511, 5650, and 8500. Consistent with these responses, the EE/CA has been revised to address these ARARs. |
| 5. | Section 4.2.3, Alternative 3. | It is stated that the salt marsh community will be expected to recolonize the backfilled clean sediment. DF G-OSPR would like to request that active salt marsh restoration be performed to ensure restoration occurs in a reasonably short time period. DF G-OSPR staff is available to consult and discuss this effort with the DoN. | The Navy will consult with DFG-OSPR regarding the possibility of active marsh restoration prior to removal action. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Regina Donohoe, Ph.D., Staff Toxicologist, California Department of Fish and Game, Letter dated 4 March 2008.

| Comment No. | Section/Page No. | Comment | Response |
|--------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6. | Section 4.2.3, Alternative 3. | Prior to implementation, it is recommended that the area be surveyed, following appropriate guidelines and protocols, to determine if special-status plants [e.g., salt marsh bird's-beak (<i>Cordylanthus maritimus</i> , ssp. <i>maritimus</i>)] have become established in the area since the last reported vegetation survey in 1994. This survey may assist in mitigating the impacts of the remediation. Due to the potential presence of federal special status species, DFG-OSPR recommends that the U.S. Fish and Wildlife Service be contacted regarding the proposed remedial actions. | <p>As part of the NBVC Point Mugu Integrated Natural Resources Management Plan (INRMP), the Navy has an ongoing program that includes annual monitoring of salt marsh bird's-beak habitat at NBVC Point Mugu. According to the 2007 survey, the closest mapped habitat is south of Beach Road and approximately 950 feet west of the IRP Site 5 boundary. The most recent survey will be consulted prior to removal action. Excerpts from the 2007 survey are provided as Attachment B of the Final FS (BEI 2008).</p> <p>As a cooperative plan, the INRMP entails coordination with two regulatory agencies, the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). In accordance with the INRMP, Navy owned lands are managed to ensure that projects carried out by the Navy do not jeopardize the continued existence of salt marsh bird's-beak, and to help foster the recovery of salt marsh bird's-beak.</p> |
| Conclusions | | | |
| 1. | | While we understand that the DoN considers the EE/CA remediation to be an interim removal action, DFG-OSPR believes that with some additional evaluation to ensure the protectiveness of the proposed RAOs, additional remediation could be avoided, expediting site closure. In particular, we believe the remedial action should address risks for chromium, cadmium, copper, lead, nickel and silver for all ecological receptors that are likely to utilize the remediated habitat. DFG-OSPR requests the EE/CA be revised based on the comments provided herein. If you have any questions or require further details, please contact Patty Velez by phone at (831) 649-2876 or e-mail (pvelez@ospr.dfg.ca.gov).. | See Response to Comment No. 3. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Chen, RPM, Brownfields and Environmental Restoration Program, Department of Toxic Substances Control, Letter dated 24 July 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Comments | | | |
| 1. | | Navy prepared this EE/CA prior to receiving from DTSC the review comments to the draft FS. DTSC understands that Navy will consider all the pertinent FS comments, particularly regarding the protective levels of Cd and Cr, when revising the EE/CA. | Comment Noted. The document has been revised as per the pertinent changes made in the "Final Focused Feasibility Study Report for Wetlands Sediment, IR Site 5, Naval Base Ventura County Point Mugu, Point Mugu, California" issued by Bechtel Environmental Inc. in July 2008. |
| Specific Comments | | | |
| 2. | p. 1-1, §1, Introduction, last paragraph, last sentence | In addition to DTSC and Water Board, please also include the California Department of Fish and Game (CDFG) in Navy's "coordination". | The text has been revised to reflect that the DON will work in coordination with the California Department of Fish and Game through the DTSC to implement this action. |
| 3. | p.2-31, Conclusions | Please add the following paragraph to address protection of wildlife: "The seasonal timing as to when to excavate that minimizes disturbance to special status wild life and other measures during the remediation activities, such as based on proximity of these wild life, time-of-day for operating equipment and other constraints; will be consulted with the CDFG". | This paragraph has been added to the Conclusions section as below: "The Navy will consult with CDFG regarding the removal action such that it minimizes disturbance to special status wild life. Considerations will include seasonal timing and other measures during the remediation activities, such as proximity of the wild life, time-of-day for operating equipment and other constraints." |
| 4. | p. 3-1, §3.1, Statutory Framework, 2 nd , paragraph | The determination on the type of compliance documentation is based upon the evaluation of a project. Please change this paragraph to read as suggested below: "DTSC has to comply with the California Environmental Quality Act (California Public Resources Code, Section 21000, et seq.) and evaluate the impact of this project on the environment. DTSC will determine the type of compliance document after an evaluation of this project". | The text has been revised as suggested. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Chen, RPM, Brownfields and Environmental Restoration Program, Department of Toxic Substances Control, Letter dated 24 July 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5. | p. 3-1, §3.3, Removal Action Objectives | Please update with the sediment management objective levels from the Feasibility Study. | The removal action objectives have been updated as per the sediment management objective levels from the Final FS (BEI 2008) as suggested and as provided below: "Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment". |
| 6. | p. 4-6, §4.2.3, Alternative 3 - Excavation of Sediment with Off-Site Treatment and Disposal, paragraph 2 nd | Although decanted water did not turn out to be problematic from past experiences, it is still prudent to double check. Please change (double underlined text) the paragraph to read as suggested below: "The excavated sediment would be temporarily stored in staging piles for dewatering. <u>Chemical profiling will be conducted for the dewatered sediment and the decanted water.</u> Dewatered sediment will be loaded into trucks to be transported and disposed of at an approved disposal facility. <u>The decanted water, if necessary, will be sent to an approved disposal facility.</u> Following excavation, confirmation sampling would be conducted to ensure that target cleanup goals based on removal action objectives are attained. Excavated areas would then be backfilled with clean sand and compacted. <u>Advice for the reconstitution of the salt marsh will be solicited from the CDFG.</u> Surficial portions of the backfill would be designed and constructed with materials similar to the physical composition of the surrounding sediment bed, with the intent that the salt marsh ecological community would re-colonize the backfill surface." | The underlined text has been added in the document as below: "Chemical profiling will be conducted for the dewatered sediment and the water generated as a result of sediment dewatering. The water generated as a result of sediment dewatering, if necessary, will be sent to an approved disposal facility. Advice for the reconstitution of the salt marsh will be solicited from the CDFG". |
| 7. | | 2/4/08 Human and Ecological Risk Division comments attached. | Responses to the Human and Ecological Risk Division comments dated 02/04/08 are attached with this set. |
| 8. | | 3/4/08 Department of Fish and Game comment attached. | Responses to the Department of Fish and Game comments dated 03/04/08 are attached with this set. |
| 9. | | 7/22/08 Geologic Services Unit no comment e-mail (not attached). | Comment Noted. No response is required. |
| 10. | | We encourage the Navy to seek (informally) early clarifications from the reviewers. | Comment Noted. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Chen, RPM, Brownfields and Environmental Restoration Program, Department of Toxic Substances Control, Letter dated 24 July 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 11. | | The Navy should include a project-related environmental impact analysis in the forthcoming detailed work plan for this removal action. This consolidated assessment is to show assurance, with certainty, that the project activities will have no significant effect on the environment affecting both human health and wild life. | Comment Noted. The Navy will provide an Environmental Protection Plan in the forthcoming detailed work plan for this removal action as suggested. |

Document Title:

(1) Draft Final, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Raftery, PG, CHG, Engineering Geologist, Site Cleanup I Unit, California Regional Water Quality Control Board, Los Angeles Region, Letter dated 12 June 2009.

| Comment No. | Section/Page No. | Comment | Response |
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| General Comments | | | |
| 1. | | Section 3.5, must be revised to indicate that the Naval Base Ventura County, Pont Mugu Facility is a joint DTSC/Regional Board lead site. Section 3.5 currently indicates that it is a DTSC lead site. | The text has been revised to reflect that Pont Mugu Facility is a joint DTSC/Regional Board lead site. |
| 2. | | The EECA must include the Regional Board's beneficial use designations for the unconfined and perched aquifers in the Oxnard Plain, including those underlying this site. Groundwater beneficial uses are stated in the June 1994, Water Quality Control Plan, Los Angeles Region (Basin Plan). The beneficial uses of the unconfined and perched aquifers in the Oxnard Plain are municipal and domestic supply, industrial process supply, industrial process supply, and agricultural supply. | Section 2.2.5 "Groundwater Quality and Use" has been updated to reflect the groundwater beneficial use designations for the site. |
| 3. | | The EECA must include a statement of the Regional Board's beneficial use designations for surface water at Mugu Lagoon. Surface water beneficial uses are stated the Basin Plan. The beneficial uses can be divided into existing and potential beneficial uses. The existing beneficial uses of surface waters in Mugu Lagoon are navigation, non-contact water recreation, commercial and sports fishing (access limited), marine habitat, estuarine habitat, wildlife habitat with pinneped haulout areas, support of areas of special biological significance, support of habitats for the survival of rare species as established under state or federal law (including Light-Footed Clapper Rail), migration of aquatic organisms, spawning, reproduction and early development of fish, shellfish harvesting, and wetland habitat. Potential beneficial uses include contact recreation. | Section 2.2.6 "Surface Water Hydrology" has been updated to reflect the surface water beneficial use designations for the site. |
| 4. | | Regional Board staff understands that the proposed excavation is, as stated in section 3.3, "an interim step, designed to remove/reduce imminent risks, until acceptable levels have been defined and the results of this removal action can be compared to those levels. If sediment concentrations in portions or all of the removal action area do not meet acceptable levels, additional response actions may be required." The Regional Board will require that the final remedy is protective of the beneficial uses of surface water and groundwater, as described in the Basin Plan. | Comment Noted. The Navy understands that the proposed excavation is an interim step, and will ensure that the final remedy is protective of the beneficial uses of surface water and groundwater, as described in the Basin Plan. |
| 5. | | A task- and site-specific health and safety plan (HASP) must be available at the site and implemented during all field activities, a copy of the HASP must be provided to the Regional Water Board at least 10 days prior to the start of field work. | Comment Noted. A task- and site-specific health and safety plan (HASP) will be made available at the site and implemented during all field activities, and a copy of the HASP will be provided to the Regional Water Board at least 10 days prior to the start of field work. |

Document Title:

(1) Draft Final, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Raftery, PG, CHG, Engineering Geologist, Site Cleanup I Unit, California Regional Water Quality Control Board, Los Angeles Region, Letter dated 12 June 2009.

| Comment No. | Section/Page No. | Comment | Response |
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| 6. | | You must notify the Regional Water Board at least 5 days prior to the start of field work. | The Navy will notify the Board at least 5 days prior to the start of the field work. |

APPENDIX E

COMMENTS ON THE ENGINEERING EVALUATION/COST ANALYSIS

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: John P. Christopher, Ph.D., Staff Toxicologist, California Department of Toxic Substances Control, Human and Ecological Risk Division, Letter dated 4 February 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-----------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Comments | | | |
| 1. | Overall | The Focused Feasibility Study and Engineering Evaluation/Cost Analysis (EE/CA) are acceptable for purposes of protection of humans and other species. In particular, applying the Remedial Action Objectives as "not to exceed" values, as stated in the EE/CA, should insure that post-remediation exposures for the California light-footed clapper rail will be low enough to be protective given the USEPA Region 9 Biological Technical Assistance Group's current efforts at deriving a new Toxicity Reference Value for cadmium. | Comment Noted. The EE/CA has been revised to incorporate the revised sediment management objectives based on the 95 percent upper confidence limit of the mean, which were approved during the 4/17/08 conference call with DTSC and DFG-OSPR, and are discussed in the "Final Focused Feasibility Study Report for Wetlands Sediment, IR Site 5, Naval Base Ventura County Point Mugu, Point Mugu, California" issued by Bechtel Environmental Inc. in July 2008. |
| 2. | Endpoints for Toxicity Reference Values (TRV) | <p>This comment is for the Navy's information; no response is required. The Biological Technical Assistance Group (BTAG) of USEPA Region 9 has published recommended TRVs for Cd but not Cr in birds (DTSC, 2002). In Appendix D to the Focused Feasibility Study, the Navy develops their own minimum and maximum TRVs for these metals. Although the Navy has departed in two important ways from the methods used by the Region 9 BTAG for developing TRVs, we find that we can work with the values they recommend, as described in the Specific Comments below.</p> <p>The first departure is limiting the choice of candidate toxic endpoints to growth and reproduction, whereas BTAG has recommended for many years that all endpoints of systemic toxicity should be considered. This is the usual practice for Reference Doses and Reference Concentrations published by USEPA to protect humans. BTAG finds an expanded suite of endpoints especially necessary when trying to protect threatened or endangered species such as the California light-footed clapper rail.</p> <p>The second departure is the Navy's choice of Lowest Observed Adverse Effect Level (LOAEL) and No Observed Adverse Effect Level (NOAEL) for their minimum and maximum TRVs. BTAG's TRV-Low and the Navy's minimum TRV make similar use of the highest bounded NOAEL (except for the difference in spectrum of toxic endpoints). The Navy selected their maximum TRV based on the lowest LOAEL higher than the highest NOAEL, which led to the minimum and maximum TRVs falling quite close together. BTAG selected a TRV-High to estimate a likely effects level in most species, with the specific intention of separating TRV-Low and TRV-High enough to present two distinct options for risk assessment and risk management.</p> | Comment Noted. |
| Specific Comments B – EE/CA | | | |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: John P. Christopher, Ph.D., Staff Toxicologist, California Department of Toxic Substances Control, Human and Ecological Risk Division, Letter dated 4 February 2008.

| Comment No. | Section/Page No. | Comment | Response |
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| 6. | Regulatory Agencies, Sec. 1, p. 1-1 | Please include the California Department of Fish & Game among the agencies and trustees with which the Navy is cooperating on cleanup of Site 5. | The text has been revised to reflect that the DON will work in coordination with the California Department of Fish and Game through the DTSC to implement this action. |
| 7. | Justification of Removal, Sec. 2.6, p. 2-31: | We concur with the Navy that removal of soils and sediments with elevated concentrations of Cd and Cr is justified for protection of the California light-footed clapper rail. | Comment Noted. |
| 8. | Removal Action Objectives (RAO), Sec. 3-3, p. 3-1: | The RAO for Cd and Cr are set equal to the SMO. We recommend that DTSC approve the RAO as stated in this section, with one minor modification. Change "sediment containing cadmium <u>and</u> chromium" and "above 17.5 mg/kg <u>and</u> 172 mg/kg chromium" to "cadmium <u>or</u> chromium" and "above 17.5 mg/kg <u>or</u> 172 mg/kg chromium". | The removal action objectives have been updated as per the sediment management objective levels from the Final FS (BEI 2008) and as provided below: "Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment". |
| 9. | Recommended Alternative, Sec. 5, p. 5-1 | We concur with the Navy's recommendation to proceed with Alternative 3, excavation, off-site disposal, and clean back-fill, as the only one of the three candidate alternatives which provides any real protection for the California light-footed clapper rail. | Comment Noted. |
| Conclusions and Recommendations | | | |
| 1. | | Although the Navy has incorrectly limited the toxic endpoints on which to base Toxicity Reference Values, we find we can work the values proposed for Cd and Cr at Site 5 as a site-specific conclusion. | Comment Noted. See Response to General Comment No. 1. |
| 2. | | The Remedial Action Objectives of 17.5 for Cd and 172 for Cr are acceptable, provided all sediments found with higher concentrations of either of these two metals are removed. Applying the Remedial Action Objectives in this manner should result in sediment concentrations well below the Sediment Management Objectives derived in the Focused Feasibility Study. | Comment Noted. See Response to Comment No. 1. In addition, the implementation of Alternative 3 is expected to result in the residual concentrations (95% UCL) of COCs at IRP Site 5 below the revised approved sediment management objectives and also within or below the established Mugu Lagoon reference values. |
| 3. | | The Focused Feasibility Study and the EE/CA for Site 5 are both acceptable with respect to protection of humans and other species. | Comment Noted. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Regina Donohoe, Ph.D., Staff Toxicologist, California Department of Fish and Game, Letter dated 4 March 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specific Comments | | | |
| 1. | Section 2, Site Characterization | The text in this section is essentially the same as presented in the Draft FS for Installation Restoration Site 5. Our comments on this section, outlined in our February 8, 2007 memorandum, continue to apply to this document and are not repeated herein. As we noted in our February 8, 2007 memorandum, DFG-OSPR has concerns regarding the maximum remaining levels of copper (2,080 mg/kg), nickel (1,000 mg/kg), lead (not listed) and silver (159 mg/kg) in soil adjacent to the plating pits, in addition to the elevated chromium and cadmium levels. DFG-OSPR recommends that all metals be analyzed in post-remediation confirmation samples to ensure that levels remaining are protective of wetland species. Sediment management objectives (SMOs) for these metals should be developed to protect the types of habitat and receptors that will potentially occur at Site 5 following remediation. These SMOs should include protection of small mammals that may use the restored area. | <p>The EE/CA has been revised to incorporate the revised sediment management objectives based on the 95 percent upper confidence limit of the mean, that were approved during the 4/17/08 conference call with DTSC and DFG-OSPR, and are discussed in the "Final Focused Feasibility Study Report for Wetlands Sediment, IR Site 5, Naval Base Ventura County Point Mugu, Point Mugu, California" issued by Bechtel Environmental Inc. in July 2008.</p> <p>The EE/CA has been revised to indicate that the confirmation samples will be analyzed for copper, nickel, lead, and silver in addition to cadmium and chromium and that the revised sediment management objectives for IRP Site 5 are protective of birds and small mammals.</p> |
| 2. | Section 2.2.7, Ecological Characterization | It is stated the descriptions of the habitats (i.e., salt marsh, tidal creek channels and intertidal mudflats) found at Site 5, north of Beach Road, are "provided below." Please provide this information as it was omitted from the document. | The text has been revised to reflect this information. |
| 3. | Section 3.3, Remedial Action Objectives (RAOs). | RAOs of 17.5 mg/kg for cadmium and 172 mg/kg for chromium in Site 5 wetland sediment are proposed in the EE/CA. As stated in our February 8, 2007 memorandum, DFG-OSPR does not concur with the selection of the avian toxicity reference values (TRVs) used to develop the RAOs for cadmium and chromium at Site 5. | The EE/CA has been revised to incorporate the revised sediment management objectives based on the 95 percent upper confidence limit of the mean, which were approved during the 4/17/08 conference call with DTSC and DFG-OSPR, and are discussed in the Final FS (BEI 2008). |
| a. | Cadmium | For cadmium, we previously recommended that the SMO should be between local ambient levels (1.9 mg/kg) and the lowest observed adverse effect level (LOAEL) TRV-based concentrations for the Clapper Rail (9 mg/kg). In a February 4, 2008 memorandum to Peter Chen, DTSC, John Christopher, DTSC, recommended a RAO of 6.1 mg/kg, but was willing to accept 17.5 mg/kg as a "not to exceed" value. DFG-OSPR is willing to accept the 17.5 mg/kg as an interim "not to exceed" RAO but would prefer that the proposed remedial action strive to achieve a 95% upper confidence limit (UCL) on the mean concentration of less than 6 mg/kg for IRP Site 5, for the protection of the Clapper Rail. As requested, it should be verified that this RAO is also protective of small mammals. | As stated in Response to Comment No.3, the revised sediment management objectives for IRP Site 5 have been developed and approved. The revised sediment management objective value for cadmium is 7.56 mg/kg and is protective of birds and small mammals. |

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(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Regina Donohoe, Ph.D., Staff Toxicologist, California Department of Fish and Game, Letter dated 4 March 2008.

| Comment No. | Section/Page No. | Comment | Response |
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| b. | Chromium | As stated in a November 20, 2006 memorandum from DF G-OSPR to DTSC, we recommend that the geometric mean of growth and reproduction no observed adverse effect levels (NOAELs; 2.66 mg/kg/d), selected as the TRV by U.S. EPA (U.S. EPA, 2005), be utilized to develop the SMO. Utilizing this TRV and the exposure factors presented in Appendix D, Section D3.2, of the Draft FS (Bechtel Environmental, Inc., 2006), the SMO would be 117 mg/kg for the Clapper Rail and the Song Sparrow. In a February 4, 2008 memorandum to Peter Chen, DTSC, John Christopher, DTSC, was willing to accept 172 mg/kg as a "not to exceed" value. DFG-OSPR is willing to accept the 172 mg/kg as an interim "not to exceed" RAO but would prefer that the proposed remedial action strive to achieve a 95% UCL on the mean concentration of less than 117 mg/kg for IRP Site 5, for the protection of the Clapper Rail. As requested, it should be verified that this RAO is also protective of small mammals. | As stated in Response to Comment No.3, the revised sediment management objectives for IRP Site 5 have been developed and approved. The revised sediment management objective value for chromium is 115 mg/kg and is protective of birds and small mammals. |
| c. | | Please change the text to indicate that the interim RAOs would be 17.5 mg/kg for cadmium or 172 mg/kg for chromium. While we understand that the DoN considers the EE/CA remediation to be an interim removal action, DFG-OSPR believes that with some additional evaluation to ensure that these "not to exceed" RAOs are protective for all metals and wetland receptors, additional remediation may not be required, expediting site closure. | The removal action objectives have been updated as per the sediment management objective levels from the Final FS (BEI 2008) and as provided below: "Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment". |
| 4. | Section 3.5 and Appendix A, Applicable or Relevant and Appropriate Requirements (ARARs) | For the Draft FS (Bechtel Environmental, Inc., 2006), Wendy Johnson, DFG-OSPR Staff Counsel, provided comments on the ARARs presented in Section 3, in a February 8, 2007 memorandum to Peter Chen, DTSC. It appears that some, but not all (e.g., DF G Code 1908, 3511 and 8500) of these concerns were addressed in the EE/CA. DFG-OSPR requests that the DoN provide responses to the comments provided in the February 8, 2007 memorandum before we provide additional comments on ARAR selection. | The Navy provided responses to comments from Wendy Johnson in Appendix E of the Final FS (BEI 2008) on California Fish and Game Code Sections 2080, 1908, 3005, 3503.5, 3511, 5650, and 8500. Consistent with these responses, the EE/CA has been revised to address these ARARs. |
| 5. | Section 4.2.3, Alternative 3. | It is stated that the salt marsh community will be expected to recolonize the backfilled clean sediment. DF G-OSPR would like to request that active salt marsh restoration be performed to ensure restoration occurs in a reasonably short time period. DF G-OSPR staff is available to consult and discuss this effort with the DoN. | The Navy will consult with DFG-OSPR regarding the possibility of active marsh restoration prior to removal action. |

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Reviewer: Regina Donohoe, Ph.D., Staff Toxicologist, California Department of Fish and Game, Letter dated 4 March 2008.

| Comment No. | Section/Page No. | Comment | Response |
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| 6. | Section 4.2.3, Alternative 3. | Prior to implementation, it is recommended that the area be surveyed, following appropriate guidelines and protocols, to determine if special-status plants [e.g., salt marsh bird's-beak (<i>Cordylanthus maritimus</i> , ssp. <i>maritimus</i>)] have become established in the area since the last reported vegetation survey in 1994. This survey may assist in mitigating the impacts of the remediation. Due to the potential presence of federal special status species, DFG-OSPR recommends that the U.S. Fish and Wildlife Service be contacted regarding the proposed remedial actions. | <p>As part of the NBVC Point Mugu Integrated Natural Resources Management Plan (INRMP), the Navy has an ongoing program that includes annual monitoring of salt marsh bird's-beak habitat at NBVC Point Mugu. According to the 2007 survey, the closest mapped habitat is south of Beach Road and approximately 950 feet west of the IRP Site 5 boundary. The most recent survey will be consulted prior to removal action. Excerpts from the 2007 survey are provided as Attachment B of the Final FS (BEI 2008).</p> <p>As a cooperative plan, the INRMP entails coordination with two regulatory agencies, the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). In accordance with the INRMP, Navy owned lands are managed to ensure that projects carried out by the Navy do not jeopardize the continued existence of salt marsh bird's-beak, and to help foster the recovery of salt marsh bird's-beak.</p> |
| Conclusions | | | |
| 1. | | While we understand that the DoN considers the EE/CA remediation to be an interim removal action, DFG-OSPR believes that with some additional evaluation to ensure the protectiveness of the proposed RAOs, additional remediation could be avoided, expediting site closure. In particular, we believe the remedial action should address risks for chromium, cadmium, copper, lead, nickel and silver for all ecological receptors that are likely to utilize the remediated habitat. DFG-OSPR requests the EE/CA be revised based on the comments provided herein. If you have any questions or require further details, please contact Patty Velez by phone at (831) 649-2876 or e-mail (pvelez@ospr.dfg.ca.gov).. | See Response to Comment No. 3. |

Document Title:

(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Chen, RPM, Brownfields and Environmental Restoration Program, Department of Toxic Substances Control, Letter dated 24 July 2008.

| Comment No. | Section/Page No. | Comment | Response |
|-------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Comments | | | |
| 1. | | Navy prepared this EE/CA prior to receiving from DTSC the review comments to the draft FS. DTSC understands that Navy will consider all the pertinent FS comments, particularly regarding the protective levels of Cd and Cr, when revising the EE/CA. | Comment Noted. The document has been revised as per the pertinent changes made in the "Final Focused Feasibility Study Report for Wetlands Sediment, IR Site 5, Naval Base Ventura County Point Mugu, Point Mugu, California" issued by Bechtel Environmental Inc. in July 2008. |
| Specific Comments | | | |
| 2. | p. 1-1, §1, Introduction, last paragraph, last sentence | In addition to DTSC and Water Board, please also include the California Department of Fish and Game (CDFG) in Navy's "coordination". | The text has been revised to reflect that the DON will work in coordination with the California Department of Fish and Game through the DTSC to implement this action. |
| 3. | p.2-31, Conclusions | Please add the following paragraph to address protection of wildlife: "The seasonal timing as to when to excavate that minimizes disturbance to special status wild life and other measures during the remediation activities, such as based on proximity of these wild life, time-of-day for operating equipment and other constraints; will be consulted with the CDFG". | This paragraph has been added to the Conclusions section as below: "The Navy will consult with CDFG regarding the removal action such that it minimizes disturbance to special status wild life. Considerations will include seasonal timing and other measures during the remediation activities, such as proximity of the wild life, time-of-day for operating equipment and other constraints." |
| 4. | p. 3-1, §3.1, Statutory Framework, 2 nd , paragraph | The determination on the type of compliance documentation is based upon the evaluation of a project. Please change this paragraph to read as suggested below: "DTSC has to comply with the California Environmental Quality Act (California Public Resources Code, Section 21000, et seq.) and evaluate the impact of this project on the environment. DTSC will determine the type of compliance document after an evaluation of this project". | The text has been revised as suggested. |

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| 5. | p. 3-1, §3.3, Removal Action Objectives | Please update with the sediment management objective levels from the Feasibility Study. | The removal action objectives have been updated as per the sediment management objective levels from the Final FS (BEI 2008) as suggested and as provided below: "Reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective (above 7.56 mg/kg for cadmium 115 mg/kg for chromium, 51.3 mg/kg for copper, 260 mg/kg for lead, 62.98 mg/kg for nickel or 5.6 mg/kg for silver, respectively) and preventing ingestion of prey that has accumulated these constituents from sediment". |
| 6. | p. 4-6, §4.2.3, Alternative 3 - Excavation of Sediment with Off-Site Treatment and Disposal, paragraph 2 nd | Although decanted water did not turn out to be problematic from past experiences, it is still prudent to double check. Please change (double underlined text) the paragraph to read as suggested below: "The excavated sediment would be temporarily stored in staging piles for dewatering. <u>Chemical profiling will be conducted for the dewatered sediment and the decanted water.</u> Dewatered sediment will be loaded into trucks to be transported and disposed of at an approved disposal facility. <u>The decanted water, if necessary, will be sent to an approved disposal facility.</u> Following excavation, confirmation sampling would be conducted to ensure that target cleanup goals based on removal action objectives are attained. Excavated areas would then be backfilled with clean sand and compacted. <u>Advice for the reconstitution of the salt marsh will be solicited from the CDFG.</u> Surficial portions of the backfill would be designed and constructed with materials similar to the physical composition of the surrounding sediment bed, with the intent that the salt marsh ecological community would re-colonize the backfill surface." | The underlined text has been added in the document as below: "Chemical profiling will be conducted for the dewatered sediment and the water generated as a result of sediment dewatering. The water generated as a result of sediment dewatering, if necessary, will be sent to an approved disposal facility. Advice for the reconstitution of the salt marsh will be solicited from the CDFG". |
| 7. | | 2/4/08 Human and Ecological Risk Division comments attached. | Responses to the Human and Ecological Risk Division comments dated 02/04/08 are attached with this set. |
| 8. | | 3/4/08 Department of Fish and Game comment attached. | Responses to the Department of Fish and Game comments dated 03/04/08 are attached with this set. |
| 9. | | 7/22/08 Geologic Services Unit no comment e-mail (not attached). | Comment Noted. No response is required. |
| 10. | | We encourage the Navy to seek (informally) early clarifications from the reviewers. | Comment Noted. |

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(1) Draft, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Chen, RPM, Brownfields and Environmental Restoration Program, Department of Toxic Substances Control, Letter dated 24 July 2008.

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| 11. | | The Navy should include a project-related environmental impact analysis in the forthcoming detailed work plan for this removal action. This consolidated assessment is to show assurance, with certainty, that the project activities will have no significant effect on the environment affecting both human health and wild life. | Comment Noted. The Navy will provide an Environmental Protection Plan in the forthcoming detailed work plan for this removal action as suggested. |

Document Title:

(1) Draft Final, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Raftery, PG, CHG, Engineering Geologist, Site Cleanup I Unit, California Regional Water Quality Control Board, Los Angeles Region, Letter dated 12 June 2009.

| Comment No. | Section/Page No. | Comment | Response |
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| General Comments | | | |
| 1. | | Section 3.5, must be revised to indicate that the Naval Base Ventura County, Pont Mugu Facility is a joint DTSC/Regional Board lead site. Section 3.5 currently indicates that it is a DTSC lead site. | The text has been revised to reflect that Pont Mugu Facility is a joint DTSC/Regional Board lead site. |
| 2. | | The EECA must include the Regional Board's beneficial use designations for the unconfined and perched aquifers in the Oxnard Plain, including those underlying this site. Groundwater beneficial uses are stated in the June 1994, Water Quality Control Plan, Los Angeles Region (Basin Plan). The beneficial uses of the unconfined and perched aquifers in the Oxnard Plain are municipal and domestic supply, industrial process supply, industrial process supply, and agricultural supply. | Section 2.2.5 "Groundwater Quality and Use" has been updated to reflect the groundwater beneficial use designations for the site. |
| 3. | | The EECA must include a statement of the Regional Board's beneficial use designations for surface water at Mugu Lagoon. Surface water beneficial uses are stated the Basin Plan. The beneficial uses can be divided into existing and potential beneficial uses. The existing beneficial uses of surface waters in Mugu Lagoon are navigation, non-contact water recreation, commercial and sports fishing (access limited), marine habitat, estuarine habitat, wildlife habitat with pinneped haulout areas, support of areas of special biological significance, support of habitats for the survival of rare species as established under state or federal law (including Light-Footed Clapper Rail), migration of aquatic organisms, spawning, reproduction and early development of fish, shellfish harvesting, and wetland habitat. Potential beneficial uses include contact recreation. | Section 2.2.6 "Surface Water Hydrology" has been updated to reflect the surface water beneficial use designations for the site. |
| 4. | | Regional Board staff understands that the proposed excavation is, as stated in section 3.3, "an interim step, designed to remove/reduce imminent risks, until acceptable levels have been defined and the results of this removal action can be compared to those levels. If sediment concentrations in portions or all of the removal action area do not meet acceptable levels, additional response actions may be required." The Regional Board will require that the final remedy is protective of the beneficial uses of surface water and groundwater, as described in the Basin Plan. | Comment Noted. The Navy understands that the proposed excavation is an interim step, and will ensure that the final remedy is protective of the beneficial uses of surface water and groundwater, as described in the Basin Plan. |
| 5. | | A task- and site-specific health and safety plan (HASP) must be available at the site and implemented during all field activities, a copy of the HASP must be provided to the Regional Water Board at least 10 days prior to the start of field work. | Comment Noted. A task- and site-specific health and safety plan (HASP) will be made available at the site and implemented during all field activities, and a copy of the HASP will be provided to the Regional Water Board at least 10 days prior to the start of field work. |

Document Title:

(1) Draft Final, Engineering Evaluation/Cost Analysis, Installation Restoration Program Site 5, Wetlands Sediment, Naval Base Ventura County, Point Mugu, California.

Reviewer: Peter Raftery, PG, CHG, Engineering Geologist, Site Cleanup I Unit, California Regional Water Quality Control Board, Los Angeles Region, Letter dated 12 June 2009.

| Comment No. | Section/Page No. | Comment | Response |
|-------------|------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 6. | | You must notify the Regional Water Board at least 5 days prior to the start of field work. | The Navy will notify the Board at least 5 days prior to the start of the field work. |

Document Title:

(1) Draft, Action Memorandum, Non-Time Critical Removal Action, Installation Restoration Program Site 5, Point Mugu, Naval Base Ventura County, California.

Reviewer: Reviewer: Peter Raftery, PG, CHG, Engineering Geologist, Site Cleanup I Unit, California Regional Water Quality Control Board, Los Angeles Region, Letter dated 7 April 2010.

| Comment No. | Section/Page No. | Comment | Response |
|------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| General Comments | | | |
| 1. | | The Draft Memorandum is approved with the understanding, as stated in the Regional Board letter of February 10, 2010, that the removal action proposed in the Draft Memorandum is to be an interim step, designed to remove/reduce imminent risks, until acceptable levels have been defined and the results of this removal action can be compared to those levels. If, following the proposed excavation, sediment contamination concentrations in portions or all of the removal action area do not meet acceptable levels; additional response actions will be required. Final cleanup goals should be developed by considering the State's Sediment Quality Objectives (SQOs) and the National Oceanic, and Atmospheric Administration's sediment quality guidelines Effects Range-Low (ERL) and Effects Range-Median (ERM) values or other appropriate criteria. The proposed goals for lead, nickel, silver, and cadmium, presented in the November 2009, <i>Final Engineering Evaluation/Cost Analysis Installation. Restoration Program Site 5. Wetlands Sediment. Naval Base Ventura County Point Mugu. Point Mugu. California</i> , exceed the ERL and would not be appropriate as final cleanup goals. | Comment Noted. |

Document Title:

(1) Draft, Action Memorandum, Non-Time Critical Removal Action, Installation Restoration Program Site 5, Point Mugu, Naval Base Ventura County, California.

Reviewer: Peter Chan, RPM, Brownfields and Environmental Restoration Program, Department of Toxic Substances Control, Email Dated 10 June 2010.

| Comment No. | Section/Page No. | Comment | Response |
|-------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specific Comments | | | |
| 1. | p.1-1, 2nd paragraph | Please remark that the light-footed clapper rail is a special status species. In addition to backfilling, please also add that Navy will reconstitute the habitat—an important point. Please add the "reconstitution" remarks to other parts of the text, e.g.: p. 5-3, 1 st paragraph of Alternative 3; p.9-1, the paragraph immediately after the 3rd bullet. | <p>The text has been revised to reflect that the light-footed clapper rail is a special status species.</p> <p>The following text regarding reconstitution was presented in Section 5.1.1, 2nd paragraph, page 5-1; and Section 5.1.3, 2nd paragraph of Alternative 3, page 5-3 of the Draft Action Memorandum presented to the agencies.</p> <p>"Advice for the reconstitution of the salt marsh will be solicited from the California Department of Fish and Game. Surficial portions of the backfill will be designed and constructed with materials similar to the physical composition of the surrounding sediment bed, with the intent that the salt marsh ecological community would recolonize the backfill surface".</p> <p>This verbiage has also been added on Page 1-1, 2nd paragraph; and on page 9-1 as suggested.</p> <p>The verbiage "reconstitution of the salt marsh" has also been on page 5-3, 1st paragraph of Alternative 3.</p> |
| 2. | Appendix C: | Please change the text to the effect that DTSC will, in compliance of CEQA requirements, document its independent assessment on the potential environmental impact of this project. (By doing this way, the approved CEQA document [regardless of the type] does not have to be in the Action Memorandum, unless Navy chooses for inclusion. However, approval of the work plan should come after the CEQA document to ensure that the salient points are included.) | <p>Appendix C has been taken out of the Action Memorandum. The Navy will include this compliance document as an appendix to the Removal Action Work Plan.</p> <p>Section 2.3 has been revised as follows:</p> <p>"The DTSC will comply with the California Environmental Quality Act (California Public Resources Code, Section 21000, et seq.) and document its independent assessment on the potential environmental impact of this project. DTSC will determine the type of compliance document after an evaluation of this project".</p> |

APPENDIX F

ADMINISTRATIVE RECORD INDEX

POINT MUGU NBVC

DRAFT ENVIRONMENTAL RESTORATION RECORD INDEX - UPDATE (SORTED BY RECORD DATE/RECORD NUMBER)

DOCUMENTS PERTAINING TO IR SITE 5 AT NBVC POINT MUGU

| UIC No. / Rec. No. | Record Date | | | | | | | |
|--------------------|-------------|------------------|--------------------------|--|--------------|-----------------|-------------------|---------------------|
| Doc. Control No. | Prc. Date | Author | | | | | | |
| Record Type | SSIC No. | Author Affil. | | | | Location | FRC Accession No. | |
| Contract No. | CTO No. | Recipient | | | | SWDIV Box No(s) | FRC Warehouse | |
| Approx. # Pages | | Recipient Affil. | Subject | | Distribution | Sites | CD No. | FRC Box No(s) |
| N63126 / 000052 | 09-01-1985 | | INITIAL ASSESSMENT STUDY | | ADMIN RECORD | SITE 00001 | FRC - PERRIS | 181-07-0019 BX 0002 |
| NEESA 13-078 | 01-01-2000 | STEARNS, | | | BASE | SITE 00002 | | 30109727 |
| REPORT | 5090.3.A. | CONRAD AND | | | | SITE 00003 | IMAGED | |
| N62474-84-C-3381 | NONE | SCHMIDT & | | | | SITE 00004 | MUGU_004 | |
| 331 | | LANDAU | | | | SITE 00005 | | |
| | | ASSOCIATES | | | | SITE 00006 | | |
| | | NAVAL ENERGY | | | | SITE 00007 | | |
| | | AND | | | | SITE 00009 | | |
| | | ENVIRONMENTAL | | | | SITE 00011 | | |
| | | SUPPORT | | | | | | |
| | | ACTIVITY | | | | | | |
| | | (NEESA) - PORT | | | | | | |
| | | HUENEME, CA | | | | | | |

| UIC No. / Rec. No. | Record Date | Author | | | | | | | |
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| Doc. Control No. | Prc. Date | Author Affil. | | | | | | | |
| Record Type | SSIC No. | Author Affil. | | | | | Location | FRC Accession No. | |
| Contract No. | CTO No. | Recipient | | | | | SWDIV Box No(s) | FRC Warehouse | |
| Approx. # Pages | | Recipient Affil. | Subject | Distribution | Sites | CD No. | | FRC Box No(s) | |
| N63126 / 000147 | 03-14-1986 | J. CLIFFORD | COMMENTS ON THE INITIAL ASSESSMENT | ADMIN RECORD | 018 | FRC - PERRIS | 181-07-0019 | BX 0004 | |
| | 01-01-2000 | U.S. EPA - SAN FRANCISCO, CA | STUDY (IAS) (AR-33) | BASE | SITE 00001 | | 30109727 | | |
| CORRESPONDENCE | 5090.3.A. | COMMANDER | | | SITE 00002 | IMAGED | | | |
| NONE | NONE | PMTIC POINT | | | SITE 00003 | MUGU_002 | | | |
| 1 | | MUGU | | | SITE 00004 | | | | |
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| | | | | | SITE 00017 | | | | |
| N63126 / 000474 | 02-28-1989 | I. MACFARLANE | DRAFT - PROPOSAL OUTLINE FOR SITE | ADMIN RECORD | SITE 00001 | FRC - PERRIS | 181-07-0019 | BX 0009 | |
| NONE | 09-21-1999 | MCCLELLAND | INVESTIGATION | | SITE 00002 | | 30109727 | | |
| MISC | 5090.3.A. | CONSULTANTS | | | SITE 00003 | IMAGED | | | |
| NONE | NONE | R. KRATZKE | | | SITE 00004 | MUGU_005 | | | |
| 4 | | | | | SITE 00005 | | | | |
| | | | | | SITE 00006 | | | | |
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| UIC No. / Rec. No. | Record Date | Author | | | | | | |
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| Doc. Control No. | Prc. Date | Author Affil. | | | | | | |
| Record Type | SSIC No. | Recipient | | | | | | |
| Contract No. | CTO No. | Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — | |
| N63126 / 000125 NONE REPO NONE 200 | 10-01-1989 01-01-2000 5090.3.A. NONE | NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY (NEESA) - PORT HUENEME, CA PMTc POINT MUGU | SITE INSPECTION (SI) FOR PACIFIC MISSILE TEST CENTER, VOLUMES I THROUGH III OF III | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| N63126 / 000138 EARTH TECH PROJECT NO. 89- 652 MM N62474-85-D-5590 14 | 01-31-1990 12-19-2001 5090.3.A. NONE | R. SUGIURA EARTH TECHNOLOGY CORP. NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY (NEESA) - PORT HUENEME, CA | MINUTES FROM 10 JANUARY 1990, OXNARD PLAIN TECHNICAL REVIEW COMMITTEE MEETING | ADMIN RECORD | BLDG. 311 SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0004 30109727 | |
| N63126 / 000057 REPO NONE 1000 | 10-01-1991 01-01-2000 5090.3.A. NONE | NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY (NEESA) - PORT HUENEME, CA NAWS POINT MUGU | FINAL DRAFT SITE INSPECTION (SI) REPORT, VOLUME IIA, APPENDIX G LABORATORY ANALYTICAL DATA PHASE I, SITES 1 THROUGH 5 | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |

| UIC No. / Rec. No. | Record Date | Author | | | | | | |
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| Contract No. | CTO No. | Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — | |
| N63126 / 000193 | 01-08-1992 01-01-2000 | PRESTON, L. COUNTY OF VENTURA SAEBFAR, H. DTSC BURBANK | IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR SITES 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, AND 11 (SEE AR #79) | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00008 SITE 00009 SITE 00010 SITE 00011 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0005 30109727 | |
| CORRESPONDENCE NONE 4 | 5090.3.A. NONE | | | | | | | |
| N63126 / 000154 | 04-22-1992 01-01-2000 | SAEBFAR, H. DTSC - BURBANK, CA STAUSS, L. NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY (NEESA) - PORT HUENEME, CA | COMMENTS ON THE FINAL DRAFT SITE INSPECTION (SI) REPORT FOR SITES 1, 2, 3, 4, 5, 6, 7, 8, 9, AND 11 (SEE AR #40 SI REPORT) | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0004 30109727 | |
| CORRESPONDENCE NONE 8 | 5090.3.A. NONE | | | | | | | |
| N63126 / 000035 | 04-24-1992 01-01-2000 | NAWS POINT MUGU NAVFAC - SOUTHWEST DIVISION | FEDERAL FACILITY SITE REMEDIATION AGREEMENT (FFSRA) INSTALLATION RESTORATION PROGRAM (IRP) SITE SUMMARIES FOR SITES 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, AND 11 | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00008 SITE 00009 SITE 00010 SITE 00011 | FRC - PERRIS IMAGED MUGU_002 | 181-07-0019 BX 0002 30109727 | |
| MISC NONE 12 | 5090.3.A. NONE | | | | | | | |

| UIC No. / Rec. No. | Record Date | Author | | | | | | | |
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| Doc. Control No. | Prc. Date | Author Affil. | | | | | | | |
| Record Type | SSIC No. | Recipient | | | | | | | |
| Contract No. | CTO No. | Recipient Affil. | | | | | | | |
| Approx. # Pages | | | | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s)—— | |
| N63126 / 000471 | 05-27-1992 | M. BUCHMAN | | COMMENTS ON THE FINAL DRAFT SITE | ADMIN RECORD | BLDG. 311 | FRC - PERRIS | 181-07-0019 BX 0009 | |
| NONE | 09-21-1999 | DEPT. OF | | INSPECTION REPORT DATED OCTOBER 31, | | SITE 00001 | | 30109727 | |
| CORRESPONDENCE | 5090.3.A. | COMMERCE | | 1991 | | SITE 00002 | IMAGED | | |
| NONE | NONE | L. STAUSS | | | | SITE 00003 | MUGU_004 | | |
| 6 | | NAVAL ENERGY | | | | SITE 00004 | | | |
| | | AND | | | | SITE 00005 | | | |
| | | ENVIRONMENTAL | | | | SITE 00006 | | | |
| | | SUPPORT | | | | SITE 00007 | | | |
| | | ACTIVITY | | | | SITE 00008 | | | |
| | | (NEESA) - PORT | | | | SITE 00009 | | | |
| | | HUENEME, CA | | | | SITE 00011 | | | |

| UIC No. / Rec. No. | Record Date | Author | | | | | | | |
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| Doc. Control No. | Prc. Date | Author Affil. | | | | | | | |
| Record Type | SSIC No. | Recipient | | | | | | | |
| Contract No. | CTO No. | Recipient Affil. | | Subject | | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — |
| N63126 / 000269 | 12-01-1992 | | | UNDERGROUND STORAGE TANK SITE | | ADMIN RECORD | 018 | NAVFAC | |
| NONE | 12-19-2001 | PRC | | ASSESSMENT - FINAL SITE INVESTIGATION | | BASE | 019 | SOUTHWEST - BLDG. | |
| REPORT | 5090.3.A. | ENVIRONMENTAL | | REPORT | | | 020 | 1 | |
| N62474-88-D-5086 | 00114 | | | | | | 021 | | |
| 375 | | NAVFAC - WESTERN DIVISION | | | | | 022 | | |
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| N63126 / 000593 | 12-01-1992 | | | PRELIMINARY DRAFT - REMEDIAL | | ADMIN RECORD | SITE 00001 | FRC - PERRIS | 181-07-0019 BX 0012 |
| | 11-15-1999 | PRC | | INVESTIGATION/FEASIBILITY STUDY WORK | | | SITE 00002 | | 30109727 |
| REPORT | 5090.3.A. | ENVIRONMENTAL | | PLAN | | | SITE 00004 | IMAGED | |
| N62474-88-D-5086 | 00225 | | | | | | SITE 00005 | MUGU_001 | |
| 319 | | NAVFAC - SOUTHWEST DIVISION | | | | | SITE 00006 | | |
| | | | | | | | SITE 00008 | | |
| | | | | | | | SITE 00009 | | |
| | | | | | | | SITE 00011 | | |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s)—— |
|------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------|
| N63126 / 000310 NONE MISC NONE 13 | 01-13-1993 01-09-2002 5090.3.A. NONE | NAWS POINT MUGU NAVFAC - SOUTHWEST DIVISION | HANDOUTS FROM SITE VISIT OF 13-14 JANUARY, 1993 | ADMIN RECORD | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00008 SITE 00009 SITE 00010 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0006 30109727 |
| N63126 / 000131 NONE REPORT N62474-88-D-5086 347 | 06-01-1993 01-01-2000 5090.3.A. 00225 | PRC ENVIRONMENTAL NAWS POINT MUGU | FINAL REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FIELD SAMPLING PLAN (FSP) [INCLUDES RESPONSES COMMENTS ON THE DRAFT FINAL RI/FS FIELD SAMPLING PLAN] (SEE RECORD # 818 THROUGH # 826 - NAWS POINT MUGU TRANSMITTAL LETTERS} | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0004 30109727 |
| N63126 / 000686 NONE REPORT N62474-88-D-5086 177 | 06-01-1993 10-11-2001 5090.3.A. 00225 | PRC ENVIRONMENTAL NAWS, POINT MUGU | FINAL REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS), QUALITY ASSURANCE PROJECT PLAN (QAPP) | ADMIN RECORD | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_004 | 181-07-0019 BX 0015 30109727 |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) |
|------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------|
| N63126 / 000687 NONE REPORT N62474-88-D-5086 146 | 06-01-1993 10-11-2001 5090.3.A. 00225 | PRC ENVIRONMENTAL NAWS POINT MUGU | FINAL REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS), HEALTH AND SAFETY PLAN | ADMIN RECORD | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0015 30109727 |
| N63126 / 000288 NONE MISC NONE 8 | 06-29-1993 09-27-2001 5090.3.A. NONE | CAPTAIN BOOTH NAVFAC - SOUTHWEST DIVISION G. HUBNER RWQCB - MONTEREY PARK | RESPONSE TO COMMENTS ON THE DRAFT PROJECT OPERATIONS PLANS (SEE AR #105 & AR #108) | ADMIN RECORD | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00008 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0006 30109727 |
| N63126 / 000034 LETT NONE 50 | 09-30-1993 01-01-2000 5090.3.A. NONE | WHITE, D.C. USEPA SHIDE, D. NAWS POINT MUGU | RESULTS OF REVIEW OF THE SITE INSPECTION (SI) REQUEST FOR SITES 1, 2, 3, 4, 5, 6, 7, 8, 9, AND 11 | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_002 | 181-07-0019 BX 0002 30109727 |
| N63126 / 000848 NONE REPORT N62474-88-D-5086 23 | 11-05-1993 10-22-2009 5090.3.A. CTO 0278 | GREUTERT, E. PRC ENVIRONMENTAL MANAGEMENT, INC. RICHTER, R. NAWS POINT MUGU, CA | ECOLOGICAL ASSESSMENT PHASE I FIELD WORK AND ASSOCIATED TASKS WORK PLAN | ADMIN RECORD BASE-READY | BLDG 00311 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |

| UIC No. / Rec. No. | Record Date | Author | | | | | | |
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| Doc. Control No. | Prc. Date | Author Affil. | | | | | | |
| Record Type | SSIC No. | Recipient | | | | | | |
| Contract No. | CTO No. | Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) | |
| N63126 / 000112 | 12-01-1993 | BOOTHE, T. | RESPONSE TO US EPA LETTER DATED 30 | ADMIN RECORD | SITE 00001 | NAVFAC | | |
| | 01-01-2000 | NAWS POINT | SEPTEMBER 1993 REGARDING REVIEW OF | BASE | SITE 00002 | SOUTHWEST - BLDG. | | |
| LETT | 5090.3.A. | MUGU | THE DRAFT FINAL SITE INSPECTION (SI) | | SITE 00004 | 1 | | |
| NONE | NONE | DOUGLAS, C. | REPORT FOR NAWS POINT MUGU, AKA | | SITE 00005 | | | |
| 4 | | USEPA | PMTc SITES 1, 2, 4, 5, 6, 8, 9, AND 11 (000034) | | SITE 00006 | | | |
| | | | | | SITE 00008 | | | |
| | | | | | SITE 00009 | | | |
| | | | | | SITE 00011 | | | |
| N63126 / 000644 | 12-17-1993 | BOOTHE, T. | NOTIFICATION THAT FIELD WORK IS | ADMIN RECORD | SITE 00001 | FRC - PERRIS | 181-07-0019 | BX 0013 |
| NONE | 02-04-2000 | NAWS POINT | SCHEDULED TO BEGIN DECEMBER 1993, | BASE | SITE 00002 | | 30109727 | |
| CORRESPONDENCE | 5090.3.A. | MUGU | INCLUDING REMEDIAL | | SITE 00004 | IMAGED | | |
| NONE | NONE | P. NAKASHIMA | INVESTIGATION/FEASIBILITY STUDY (RI/FS) | | SITE 00005 | MUGU_001 | | |
| 1 | | DTSC GLENDALE | AND ENVIRONMENTAL ASSESSMENT (EA) | | SITE 00006 | | | |
| | | | ACTIVITIES | | SITE 00008 | | | |
| | | | | | SITE 00009 | | | |
| | | | | | SITE 00011 | | | |
| N63126 / 000113 | 12-21-1993 | SAEBFAR, H. | RESPONSE TO LETTER DATED 23 | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 | BX 0003 |
| | 01-01-2000 | DTSC - BURBANK, | NOVEMBER 1993, REQUESTING DTSC TO | BASE | SITE 00006 | | 30109727 | |
| CORRESPONDENCE | 5090.3.A. | CA | RECONSIDER THE NO FURTHER ACTION | | SITE 00013 | IMAGED | | |
| NONE | NONE | SAUERWEIN, LT | RECOMMENDATION ENTITLED "REMOVAL | | SITE 00015 | MUGU_003 | | |
| 2 | | NCBC PORT | EVALUATION FOR SITES 5, 6, 12, 13, AND 15" | | | | | |
| | | HUENEME | | | | | | |
| N63126 / 000637 | 01-01-1994 | | FINAL - ECOLOGICAL ASSESSMENT, PHASE | ADMIN RECORD | SITE 00001 | SOUTHWEST | | |
| NONE | 01-24-2000 | PRC | I FIELD SAMPLING PLAN | | SITE 00002 | DIVISION - BLDG. 12 | | |
| CORRESPONDENCE | 5090.3.A. | ENVIRONMENTAL | | | SITE 00004 | | | |
| N62474-88-D-5086 | 00225 | | | | SITE 00005 | | | |
| 500 | | NFESC PORT | | | SITE 00006 | | | |
| | | HUENEME | | | SITE 00008 | | | |
| | | | | | SITE 00009 | | | |
| | | | | | SITE 00011 | | | |

| UIC No. / Rec. No. | Record Date | Author | | | | | | | |
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| Record Type | SSIC No. | Recipient | | | | | | | |
| Contract No. | CTO No. | Recipient Affil. | | | | | | | |
| Approx. # Pages | | | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — | | |
| N63126 / 000372 | 06-01-1994 | | SITE HEALTH AND SAFETY PLAN (HASP), | ADMIN RECORD | SITE 00005 | NAVFAC | | | |
| | 01-01-2000 | IT CORPORATION | EMERGENCY REMOVAL ACTION | BASE | | SOUTHWEST - BLDG. | | | |
| CORRESPONDENCE | 5090.3.A. | | | | | 1 | | | |
| N62474-93-D-215 | NONE | NFEC SAN BRUNO | | | | | | | |
| 150 | | | | | | | | | |
| N63126 / 000402 | 06-01-1994 | | ENVIRONMENTAL FACT SHEET, | ADMIN RECORD | SITE 00001 | FRC - PERRIS | 181-07-0019 | BX 0008 | |
| NONE | 01-01-2000 | NAWS POINT | RESTORATION ADVISORY BOARD (RAB) | BASE | SITE 00002 | | 30109727 | | |
| FACT SHEET | 5090.3.A. | MUGU | ISSUE 2 | | SITE 00003 | IMAGED | | | |
| NONE | NONE | | | | SITE 00004 | MUGU_002 | | | |
| 8 | | GENERAL PUBLIC | | | SITE 00005 | | | | |
| | | | | | SITE 00006 | | | | |
| | | | | | SITE 00007 | | | | |
| | | | | | SITE 00008 | | | | |
| | | | | | SITE 00009 | | | | |
| | | | | | SITE 00010 | | | | |
| | | | | | SITE 00011 | | | | |
| N63126 / 000370 | 06-15-1994 | STAUSS, L. | MEETING MINUTES FROM CONFERENCE | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 | BX 0007 | |
| | 01-01-2000 | NAVAL ENERGY | CALL - 09 JUNE 1994 | BASE | | | 30109727 | | |
| TEL | 5090.3.A. | AND | | | | IMAGED | | | |
| NONE | NONE | ENVIRONMENTAL | | | | MUGU_003 | | | |
| 9 | | SUPPORT | | | | | | | |
| | | ACTIVITY | | | | | | | |
| | | (NEESA) - PORT | | | | | | | |
| | | HUENEME, CA | | | | | | | |
| | | RAB MEMBERS | | | | | | | |
| N63126 / 000374 | 06-20-1994 | | CONTRACTOR QUALITY CONTROL PLAN | ADMIN RECORD | SITE 00005 | NAVFAC | | | |
| NONE | 01-01-2000 | ITC | (QCP) EMERGENCY REMOVAL ACTION | BASE | | SOUTHWEST - BLDG. | | | |
| REPO | 5090.3.A. | | (ERA) | | | 1 | | | |
| N62474-93-D-215 | DO 12 | NFEC SAN BRUNO | | | | TO BE DELETED | | | |
| 250 | | | | | | | | | |

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| Contract No. | CTO No. | Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — | |
| N63126 / 000133 NONE CORRESPONDENCE NONE 3 | 06-22-1994 09-10-1999 5090.3.A. NONE | T. PREBEL DON C. FAANES | DOCUMENTATION REGARDING NAVY DECISION TO UNDERTAKE AN EMERGENCY REMOVAL ACTION OF HAZARDOUS LEVELS OF CADMIUM, CHROMIUM, COPPER, NICKEL AND SILVER | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| N63126 / 000368 CORRESPONDENCE NONE 5 | 06-22-1994 01-01-2000 5090.3.A. NONE | KELLEY, J.W. NAWS POINT MUGU | REMOVAL ACTION APPROVAL AS DETAILED IN SECTION 3.0 OF THIS ACTION MEMORANDUM | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 30109727 | BX 0007 |
| N63126 / 000376 CORRESPONDENCE NONE 2 | 06-24-1994 01-01-2000 5090.3.A. NONE | J. TURNER CA DEPT OF FISH & GAME R. RICHTER / L. STRAUSS NFESC PORT HUENEME | NOTIFICATION THAT THE CALIFORNIA DEPARTMENT OF FISH AND GAME IS IN THE PROCESS OF FINALIZING ITS WORK PLAN WITH DTSC WHICH IS THE LEAD BASE REALIGNMENT AND CLOSURE/INSTALLATION RESTORATION STATE AGENCY IN ORDER TO OBTAIN FUNDING FOR ITS OWN BRAC/IR TEAM | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 30109727 | BX 0007 |
| N63126 / 000321 PTMUGU SER P7321/Q-281, 282, 283,284 XMTL NONE 4 | 07-05-1994 01-09-2002 5090.3.A. NONE | BOOTHE, T. NAWS POINT MUGU HUBNER, HENRY, WELSH, BEKELE CRWQCB, US F&W, US ARMY, DTSC | TRANSMITTAL OF A FOLLOWUP COPY OF THE SIGNED ACTION MEMORANDUM FOR THE OLD 6 AREA SHOPS (W/O ENCLOSURE) | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| N63126 / 000294 MISC NONE 1 | 08-11-1994 01-01-2000 5090.3.A. NONE | OXNARD STAR PUBLIC | PUBLIC AVAILABILITY REGARDING ACTION MEMORANDUM FOR THE EMERGENCY REMOVAL ACTION (ERA) | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 30109727 | BX 0006 |

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| N63126 / 000295 MISC NONE 1 | 08-11-1994 01-01-2000 5090.3.A. NONE | LOS ANGELES TIMES PUBLIC | PUBLIC AVAILABILITY REGARDING ACTION MEMORANDUM FOR THE EMERGENCY REMOVAL ACTION (ERA) | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0006 30109727 |
| N63126 / 000296 MISC NONE 1 | 08-18-1994 01-01-2000 5090.3.A. NONE | MISSILE NEWS GENERAL PUBLIC | PUBLIC AVAILABILITY REGARDING NAVY EXCAVATED APPROXIMATELY 80 CUBIC YARDS OF METALS CONTAMINATED SOIL, SITE 5-6/24 | ADMIN RECORD BASE | 024 SITE 00005 SITE 00006 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0006 30109727 |
| N63126 / 000728 NONE REPORT N62474-93-D-2151 8 | 08-25-1994 01-10-2005 5090.3.A. DO 0012 | IT CORPORATION NAVFAC - EFA WEST | WORK PLAN FOR THE PHASE II OF EMERGENCY REMOVAL ACTION (ERA) | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000638 NONE MM NONE 3 | 09-22-1994 01-24-2000 5090.3.A. NONE | L. STAUSS DON VARIOUS AGENCIES | MINUTES OF SEPTEMBER 22, 1994 IRP PROJECT TEAM CONFERENCE CALL | ADMIN RECORD | SITE 00005 SITE 00007 SITE 00010 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0013 30109727 |
| N63126 / 000231 NONE CORRESPONDENCE NONE 7 | 10-27-1994 12-19-2001 5090.3.A. NONE | L. STRAUSS NFESC - PORT HUENEME M. ESHAGHIAN DTSC - GLENDALE | REQUEST FOR THIRTY DAY EXTENSION FOR REMOVAL OF WASTES WITH ATTACHMENTS OF STORAGE EXTENSION APPLICATION AND NOTICE OF APPROVAL FOR STORAGE EXTENSION FROM DTSC | ADMIN RECORD | SITE 00005 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0005 30109727 |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s)—— |
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| N63126 / 000320 NONE XMTL NONE 7 | 11-23-1994 01-09-2002 5090.3.A. NONE | L. STAUSS NFESC PORT HUENEME T. BEKELE DTSC - LONG BEACH | TRANSMITTAL OF MINUTES FROM 18 OCTOBER 1994, PROJECT TEAM REMEDIAL INVESTIGATION MEETING | ADMIN RECORD | SITE 00001 SITE 00002 SITE 00004 SITE 00005 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0006 30109727 |
| N63126 / 000063 REPORT N62474-93-D-215 275 | 12-01-1994 01-01-2000 5090.3.A. DO 12 | WARREN, J.M. ITC NAVFAC - SOUTHWEST DIVISION | DRAFT IMPLEMENTATION REPORT EMERGENCY REMOVAL ACTION (ERA) AT INSTALLATION RESTORATION (IR) SITE 5, REVISION 0 | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0003 30109727 |
| N63126 / 000064 REPORT N62474-88-D-5086 52 | 05-30-1995 01-01-2000 5090.3.A. 00273 | PRC ENVIRONMENTAL MGMT. NAVFAC - SOUTHWEST DIVISION | DRAFT ON-SCENE COORDINATOR'S REPORT EMERGENCY REMOVAL ACTION (ERA) VOLUME II, TEXT, FIGURES, TABLE, AND APPENDICES | ADMIN RECORD | SITE 00005 | FRC - PERRIS IMAGED MUGU_002 | 181-07-0019 BX 0003 30109727 |
| N63126 / 000382 NONE MM NONE 24 | 05-02-1996 09-10-1999 5090.3.A. NONE | PT MUGU VARIOUS | RESTORATION ADVISORY BOARD AGENDA/HANDOUTS AND MEETING MINUTES FROM MEETING ON MAY 2, 1996 | ADMIN RECORD | SITE 00001 SITE 00004 SITE 00005 SITE 00007 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0007 30109727 |
| N63126 / 000391 NONE MM NONE 25 | 07-11-1996 09-10-1999 5090.3.A. NONE | PT MUGU VARIOUS | RESTORATION ADVISORY BOARD AGENDA/HANDOUTS AND MEETING MINUTES FROM JULY 11, 1996 MEETING | ADMIN RECORD | SITE 00001 SITE 00004 SITE 00005 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0007 30109727 |

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| Contract No. | CTO No. | Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) | |
| N63126 / 000428 | 10-01-1996 01-01-2000 | GASLAN, M. DTSC - LONG BEACH, CA | COMMENTS ON THE BULK SAMPLING PERFORMED FOR BENCH SCALE TREATABILITY STUDY | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS | 181-07-0019 BX 0008 30109727 | |
| CORRESPONDENCE NONE 3 | 5090.3.A. NONE | DAWSON, D. NAVFAC - SOUTHWEST DIVISION | | | | IMAGED MUGU_004 | | |
| N63126 / 000803 | 10-30-1996 05-19-2008 | LB&M ASSOCIATES, INC. | DRAFT FIELD SAMPLING PLAN FOR THE INITIAL SITE CHARACTERIZATION TO SUPPORT THE EVALUATION AND INVESTIGATION OF IN SITU | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| REPORT DAAA15-93-D-0009 40 | 5090.3.A. DO 0003 | COMMANDER US ARMY ENVIRONMENTAL CENTER | ELECTROKINETIC REMEDIATION OF METAL CONTAMINATED SOILS, AT THE OLD AREA 6 SHOPS | | | | | |
| N63126 / 000804 | 10-30-1996 05-19-2008 | LB&M ASSOCIATES, INC. | DRAFT QUALITY ASSURANCE PROGRAM PLAN FOR THE INITIAL SITE CHARACTERIZATION TO SUPPORT THE EVALUATION AND INVESTIGATION OF IN SITU ELECTROKINETIC REMEDIATION OF | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| REPORT DAAA15-93-D-0009 90 | 5090.3.A. DO 0003 | COMMANDER US ARMY ENVIRONMENTAL CENTER | METAL CONTAMINATED SOILS, AT THE OLD AREA 6 SHOPS | | | | | |
| N63126 / 000494 | 11-18-1996 01-01-2000 | DAWSON, D. NAVFAC - SOUTHWEST DIVISION | TRANSMITTAL OF DOCUMENTS TO SUPPORT THE EVALUATION AND INVESTIGATION OF IN-SITU ELECTROKINETIC REMEDIATION OF METALS | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| LETT NONE 2 | 5090.3.A. NONE | EDWARDS, M. DTSC LONG BEACH | | | | | | |
| N63126 / 000493 | 11-21-1996 01-01-2000 | DAWSON, D. NAVFAC - SOUTHWEST DIVISION | ENCLOSED DOCUMENTS AS REQUESTED RELATED TO WORK THAT WAS PERFORMED IN 1994 AND 1996 AT INSTALLATION RESTORATION (IR) SITE 5 (WITHOUT ENCLOSURE) | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| LETT NONE 2 | 5090.3.A. NONE | EDWARDS, M. DTSC LONG BEACH | | | | | | |

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| Approx. # Pages | | | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s)—— | |
| N63126 / 000841 | 12-12-1996 | ROSS, J. | COMMENTS ON THE FINAL SITE | ADMIN RECORD | SITE 00001 | NAVFAC | | |
| NONE | 03-02-2009 | CRWQCB - | INVESTIGATION REPORT, UNDERGROUND | BASE | SITE 00002 | SOUTHWEST - BLDG. | | |
| CORRESPONDENCE | 5090.3.A. | MONTEREY PARK, | STORAGE TANK SITE ASSESSMENT, AND | | SITE 00003 | 1 | | |
| NONE | NONE | CA | DETERMINATION OF NO FURTHER ACTION | | SITE 00004 | | | |
| 1 | | GRANADE, J. | FOR SITES 1 THROUGH 5, 8 THROUGH 20, | | SITE 00005 | | | |
| | | NAWS POINT | 22, 25 THROUGH 46, AND 48 THROUGH 54 | | SITE 00006 | | | |
| | | MUGU, CA | | | SITE 00007 | | | |
| | | | | | SITE 00008 | | | |
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| | | | | | SITE 00053 | | | | |
| | | | | | SITE 00054 | | | | |
| N63126 / 000504 | 12-23-1996 | EDWARDS, M. | COMMENTS ON THE SITE MITIGATION | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 BX 0010 | | |
| | 01-01-2000 | DTSC - LONG | BRANCH IN LONG BEACH | BASE | | | 30109727 | | |
| CORRESPONDENCE | 5090.3.A. | BEACH, CA | | | | IMAGED | | | |
| NONE | NONE | EDWARDS, M. | | | | MUGU_005 | | | |
| 5 | | DTSC LONG | | | | | | | |
| | | BEACH | | | | | | | |
| N63126 / 000570 | 03-04-1997 | BRAY, J. | FINAL DOCUMENTS OF FSP FOR THE | ADMIN RECORD | SITE 00005 | NAVFAC | | | |
| | 01-01-2000 | NAVFAC - | INITIAL SITE CHARACTERIZATION TO | BASE | | SOUTHWEST - BLDG. | | | |
| CORRESPONDENCE | 5090.3.A. | SOUTHWEST | SUPPORT EVALUATION AND | | | 1 | | | |
| NONE | NONE | DIVISION | INVESTIGATION OF IN SITU | | | | | | |
| 6 | | HOHMAN, JUDY | ELECTROKINETIC REMEDIATION METALS | | | | | | |
| | | USF&WS | AND QAPP FOR SITE 5 ALL COMMENTS AND | | | | | | |
| | | | CONCERNS INCORPORATED | | | | | | |

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| Contract No. | CTO No. | Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) | | |
| N63126 / 000562 | 04-14-1997 | SANCHEZ, YVONNE | COMMENTS ON THE DRAFT PHASE I REMEDIAL INVESTIGATION, TECHNICAL MEMORANDUM | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00010 SITE 00011 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0012 30109727 | | |
| CORRESPONDENCE NONE 18 | 01-01-2000 5090.3.A. NONE | DTSC - LONG BEACH, CA DAWSON, DAVID NAVFAC - SOUTHWEST DIVISION | | | | | | | |
| N63126 / 000684 | 04-14-1997 | M. MCCRINK | COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION, TECHNICAL MEMORANDUM | ADMIN RECORD BASE | BLDG. 311 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0015 30109727 | | |
| CORRESPONDENCE NONE 20 | 10-01-2001 5090.3.A. NONE | DTSC - SACRAMENTO, CA Y. SANCHEZ DTSC - LONG BEACH | | | | | | | |
| N63126 / 000522 | 04-23-1997 | SANCHEZ, YVONNE | COMMENTS ON THE DRAFT PHASE 1 REMEDIAL INVESTIGATION (RI) REPORT, TECHNICAL MEMORANDUM | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00010 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0010 30109727 | | |
| CORRESPONDENCE NONE 22 | 01-01-2000 5090.3.A. NONE | DTSC DAWSON, DAVID NAVFAC - SOUTHWEST DIVISION | | | | | | | |
| N63126 / 000518 | 05-22-1997 | HALEY, JOHN, C. | DRAFT TECHNICAL DATA REPORT FOR FY 1997, CHARACTERIZATION EVENT COVERING THE EVALUATION AND INVESTIGATION OF IN SITU ELECTROKINETIC REMEDIATION OF METALS CONTAMINATED SOILS AT THE OLD AREA 6 SHOPS | ADMIN RECORD | SITE 00005 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0010 30109727 | | |
| REPORT NONE 124 | 01-01-2000 5090.3.A. NONE | LB&M FABIAN, G. USAEC | | | | | | | |

| UIC No. / Rec. No. | Record Date | Author | | | | | | |
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| Contract No. | CTO No. | Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — | |
| N63126 / 000521 | 06-24-1997 01-01-2000 | SOOHOO, ROGER | RESPONSE TO REQUEST ON APPLYING FOR A RESEARCH, DESIGN AND DEVELOPMENT (RD&D) PERMIT FOR THE PROPOSED ELECTROKINETICS PILOT STUDY AT INSTALLATION RESTORATION PROGRAM SITE 5 | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS | 181-07-0019 | BX 0010 |
| CORRESPONDENCE NONE 3 | 5090.3.A. NONE | NAVFAC - SOUTHWEST DIVISION SANCHEZ, YVONNE DTSC | | | | IMAGED MUGU_005 | 30109727 | |
| N63126 / 000589 | 09-04-1997 01-01-2000 | NAWS POINT MUGU | SEPTEMBER 4, 1997 MEETING MINUTES ON THE ELECTROKINETIC TECHNOLOGY DEMONSTRATION IN PROGRESS REVIEW MEETING SITE 5 | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| MINU NONE 4 | 5090.3.A. NONE | | | | | | | |
| N63126 / 000582 | 09-15-1997 01-01-2000 | WILLIS, MARTIN LB&M SANCHEZ, YVONNE DTSC LONG BEACH | RESPONSES TO PRE-DEMONSTRATION FIELD TEST, REVISED AMENDMENTS TO THE ELECTROKINETIC SYSTEM, ESTIMATION OF CHLORINE GAS EVOLUTION, AND VOLUME REDUCTION OF ELECTROLYTE SOLUTION CONCENS RAISED BY DTSC AND EFA WEST FOR SITE 5 "PROPRIETARY" | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| LETT NONE 10 | 5090.3.A. NONE | | | | | | | |
| N63126 / 000585 | 09-30-1997 01-01-2000 | SANCHEZ, YVONNE DTSC - CYPRESS, CA SOOHOO, ROGER H. EFA WEST SAN BRUNO | COMMENTS ON THE DRAFT TECHNOLOGY DEMONSTRATION PLAN ELECTROKINETIC DEMONSTRATION DATED AUGUST 28, 1997 AND THE PRE-DEMONSTRATION ACTIVITIES ADDENDUM DATED SEPTEMB | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| CORRESPONDENCE NONE 11 | 5090.3.A. NONE | | | | | | | |
| N63126 / 000586 | 10-08-1997 01-01-2000 | SANCHEZ, YVONNE DTSC - LONG BEACH, CA SOOHOO, ROGER H. EFA WEST SAN BRUNO | COMMENTS ON THE DRAFT TECHNOLOGY DEMONSTRATION PLAN ELECTROKINETIC DEMONSTRATION DRAFT HEALTH AND SAFETY PLAN DATED AUGUST 30, 1997 | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| CORRESPONDENCE NONE 6 | 5090.3.A. NONE | | | | | | | |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s)—— |
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| N63126 / 000546 MISC NONE 2 | 10-16-1997 01-01-2000 5090.3.A. NONE | SOOHOO, ROGER H. NAVFAC - WESTERN DIVISION SANCHEZ, YVONNE DTSC | RESPONSE TO COMMENTS ON THE ELECTROKINETICS WORK PLAN WHICH RECOMMENDED THE PREPARATION OF AN ENGINEERING EVALUATION/ACTION MEMO | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0011 30109727 |
| N63126 / 000587 LETT NONE 45 | 10-24-1997 01-01-2000 5090.3.A. NONE | ARNOLD, J. US ARMY SANCHEZ, YVONNE DTSC LONG BEACH | RESPONSE TO DTSC COMMENTS ON THE DRAFT TECHNOLOGY DEMONSTRATION PLAN FOR THE ELECTROKINETICS TREATABILITY STUDY | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000588 LETT NONE 50 | 10-24-1997 01-01-2000 5090.3.A. NONE | ARNOLD, J. US ARMY SOOHOO, ROGER H. EFA WEST SAN BRUNO | RESPONSES (ARMY/NAVY) TO DTSC COMMENTS TO DRAFT TECHNOLOGY DEMONSTRATION PLAN FOR THE ELECTROKINETICS TREATABILITY STUDY | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 TO BE DELETED BOX 15 OF 15 | |
| N63126 / 000554 CORRESPONDENCE NONE 367 | 02-02-1998 01-01-2000 5090.3.A. NONE | HALEY, J. LB&M ASSOCIATES, INC NAWS POINT MUGU | FINAL TECHNOLOGY DEMONSTRATION PLAN ELECTROKINETIC DEMONSTRATION (VOL I); HEALTH & SAFETY PLAN ELECTROKINETIC REMEDIATION OF METALS CONTAMINATED SOIL (VOL II); INITIAL CHARACTERIZATION EVENT IN SITU ELECTROKINETIC REMEDIATION DEMO (VOL III) SEE COMMENTS | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0011 30109727 |
| N63126 / 000575 CORRESPONDENCE NONE 7 | 02-06-1998 01-01-2000 5090.3.A. NONE | SCANDURA, J. DTSC SOOHOO, ROGER H. EFA WEST SAN BRUNO | RESPONSE TO NAVY LETTER OF JUNE 24, 1997 DTSC HAS DETERMINED THAT CERCLA SECTION 121(E) DOES NOT PROVIDE GROUNDS TO AVOID COMPLIANCE WITH CALIFORNIA PERMIT REQUIREMENTS | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0012 30109727 |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) |
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| N63126 / 000572 CORRESPONDENCE NONE 1 | 02-27-1998 01-01-2000 5090.3.A. NONE | ALONZO, M. DTSC - LONG BEACH, CA SOOHOO, ROGER H. EFA WEST SAN BRUNO | APPROVAL TO START FIELD WORK AS PLANNED IN THE FINAL ELECTROKINETIC TECHNOLOGY DEMONSTRATION PLAN OF FEBRUARY 2, 1998 | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0012 30109727 |
| N63126 / 000563 CORRESPONDENCE NONE 4 | 05-14-1998 01-01-2000 5090.3.A. NONE | ROSS, J. E. CRWQCB GRANADE, STEVE NAWS POINT MUGU | COMMENTS ON THE DRAFT FIELD SAMPLING PLAN ADDENDUM | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00011 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0012 30109727 |
| N63126 / 000556 REPORT N62474-88-D-5086 4059 | 06-01-1998 01-01-2000 5090.3.A. 00273 | PRC ENVIRONMENTAL NAWS POINT MUGU | DRAFT FINAL PHASE I REMEDIAL INVESTIGATION TECHNICAL MEMORANDUM VOLUME 1 (CHAPTERS 1- 13), VOLUME 2 (APPENDIX A-O), VOLUME 3 (APPENDIX P-CC) | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_004 | 181-07-0019 BX 0011 30109727 BX 0012 |
| N63126 / 000565 XMTL NONE 2 | 06-03-1998 01-01-2000 5090.3.A. NONE | WALKER, AMY NAVFAC - SOUTHWEST DIVISION ALONZO, M. DTSC CYPRESS | DRAFT FINAL PHASE I REMEDIAL INVESTIGATION SENT FOR COMMENTS AND RECOMMENDATIONS | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0012 30109727 |
| N63126 / 000659 NONE MEMO NONE 12 | 07-01-1998 10-19-2000 5090.3.A. NONE | J. ARNOLD ARMY ENVIRONMENTAL CENTER COMMANDER NFESC PORT HUENEME | MEMO REGARDING ISSUE OF ADDENDUM III TO THE TECHNOLOGY DEMONSTRATION PLAN FOR THE ELECTROKINETICS TREATABILITY STUDY INCLUDES MEETING MINUTES FROM PROCESS REVIEW HELD AT LYNNTECH FACILITY(SEE AR #658 - ADDENDUM III) | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — |
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| N63126 / 000658 NONE MISC NONE 21 | 07-10-1998 10-19-2000 5090.3.A. NONE | ADVANCIA CORPORATION NAVFAC - SOUTHWEST DIVISION | ADDENDUM III - SYSTEM DESIGN AND MONITORING REVISIONS & ADDENDUM II - HEALTH AND SAFETY PLAN REVISIONS OF THE TECHNOLOGY DEMONSTRATION PLAN, ELECTROKINETICS TECHNOLOGY DEMONSTRATION (SEE AR #606 & AR #608 - COMMENTS BY DTSC, AR #661, AR #662) | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000661 NONE MEMO NONE 9 | 07-27-1998 10-20-2000 5090.3.A. NONE | J. ARNOLD ARMY ENVIRONMENTAL CENTER B. HARRE NFESC PORT HUENEME | ISSUE OF ADDENDUM II TO THE HEALTH AND SAFETY PLAN (HASP) FOR THE ELECTROKINETICS TREATABILITY STUDY (SEE AR #658 - HASP ADDENDUM II) | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000662 NONE MISC NONE 17 | 08-13-1998 10-20-2000 5090.3.A. NONE | ADVANCIA CORPORATION NAVFAC - SOUTHWEST DIVISION | RESPONSE TO DTSC COMMENTS ON ADDENDUM III TO THE TECHNOLOGY DEMONSTRATION PLAN (SEE AR #658 - ADDENDUM III) | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000608 MEMO NONE 5 | 08-20-1998 11-16-1999 5090.3.A. NONE | K. YOKOTA DTSC M. ALONZO DTSC | HEALTH AND SAFETY PLAN FOR THE OLD AREA 6 SHOPS | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_004 | 181-07-0019 BX 0013 30109727 |
| N63126 / 000616 MEMO NONE 6 | 11-09-1998 11-16-1999 5090.3.A. NONE | J. ARNOLD DOA B. HARRE NFESC, PORT HUENEME | ISSUE OF ADDENDUM IV TO THE TECHNOLOGY DEMONSTRATION PLAN FOR THE ELECTROKINETICS TREATABILITY STUDY. WITH ENCLOSURE OF THE DRAFT ADDENDUM IV | ADMIN RECORD | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |

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| Approx. # Pages | | Recipient Affil. | | | | | | | |
| N63126 / 000618 | 12-17-1998 | S. FAIR | COMMENTS ON DRAFT FINAL PHASE I | ADMIN RECORD | SITE 00001 | FRC - PERRIS | 181-07-0019 | BX 0013 | |
| | 11-16-1999 | DTSC | REMEDIAL INVESTIGATION TECHNICAL | BASE | SITE 00002 | | 30109727 | | |
| CORRESPONDENCE | 5090.3.A. | B. HARRE | MEMORANDUM | | SITE 00005 | IMAGED | | | |
| NONE | NONE | NFESC, PORT | | | SITE 00006 | MUGU_004 | | | |
| 15 | | HUENEME | | | SITE 00008 | | | | |
| | | | | | SITE 00009 | | | | |
| N63126 / 000635 | 05-17-1999 | DOBREI, C. | MINUTES FROM MEETINGS HELD MAY 19, | ADMIN RECORD | 024 | FRC - PERRIS | 181-07-0019 | BX 0013 | |
| NONE | 01-24-2000 | TETRA TECH EM | 1997 AND JULY 29, 1997 REGARDING THE | | SITE 00001 | | 30109727 | | |
| MM | 5090.3.A. | INC. | DRAFT FINAL PHASE I REMEDIAL | | SITE 00002 | IMAGED | | | |
| NONE | NONE | B. HARRE | INVESTIGATION TECHNICAL MEMORANDUM | | SITE 00004 | MUGU_001 | | | |
| 8 | | NFESC PORT | | | SITE 00005 | | | | |
| | | HUENEME | | | SITE 00006 | | | | |
| | | | | | SITE 00008 | | | | |
| | | | | | SITE 00009 | | | | |
| | | | | | SITE 00011 | | | | |
| N63126 / 000636 | 05-24-1999 | S. MURPHY | MINUTES OF JAN. 14, 1999 MEETING ON | ADMIN RECORD | 024 | FRC - PERRIS | 181-07-0019 | BX 0013 | |
| NONE | 01-24-2000 | NAVFAC - | PHASE I REMEDIAL INVESTIGATION WITH | BASE | SITE 00001 | | 30109727 | | |
| MM | 5090.3.A. | SOUTHWEST | RESPONSE TO COMMENTS ON THE DRAFT | | SITE 00002 | IMAGED | | | |
| NONE | NONE | DIVISION | FINAL REMEDIAL INVESTIGATION | | SITE 00004 | MUGU_001 | | | |
| 31 | | M. ALONZO | | | SITE 00005 | | | | |
| | | DTSC CYPRESS | | | SITE 00006 | | | | |
| | | | | | SITE 00008 | | | | |
| | | | | | SITE 00009 | | | | |
| | | | | | SITE 00011 | | | | |

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| N63126 / 000844 NONE CORRESPONDENCE NONE 1 | 08-24-1999 04-03-2009 5090.3.A. NONE | PRINGLE, G. NBVC PORT HUENEME RAB MEMBERS | LETTER OF NOTIFICATION OF THE CANCELLATION OF THE 02 SEPTEMBER 1999 RESTORATION ADVISORY BOARD (RAB) MEETING | ADMIN RECORD BASE | BASEWIDE SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00007 SITE 00008 SITE 00009 SITE 00010 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | | | |
| N63126 / 000621 MEMO NONE 4 | 08-30-1999 11-16-1999 5090.3.A. NONE | M. MCCRINK GEOLOGIC SERVICES UNIT M. ALONZO DTSC | DRAFT MEMORANDUM - COMMENTS REGARDING REVIEW OF DELINEATION AND HYDROGEOLOGIC CHARACTERIZATION FOR TRIHALOMETHANE REMEDIATION, DATED AUGUST 2, 1999 | ADMIN RECORD | SITE 00005 | FRC - PERRIS IMAGED MUGU_004 | 181-07-0019 BX 0013 30109727 | | |
| N63126 / 000622 NONE FACT SHEET NONE 5 | 09-01-1999 11-16-1999 5090.3.A. NONE | | FALL 1999 ENVIRONMENTAL FACT SHEET | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00020 SITE 00024 | FRC - PERRIS IMAGED MUGU_003 | 181-07-0019 BX 0013 30109727 | | |

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| N63126 / 000680 | 09-27-1999 | DOBREI, C. | DRAFT COMMUNITY RELATIONS PLAN | ADMIN RECORD | BLDG 00182 | FRC - PERRIS | 181-07-0019 BX 0014 | | |
| NONE | 08-27-2001 | TETRA TECH EM | (INCLUDES NCBC PORT HUENEME AND | | BLDG 00311 | | 30109727 | | |
| REPORT | 5090.3.A. | INC. | THE CHANNEL ISLANDS) | | SITE 00001 | IMAGED | | | |
| N62474-94-D-7609 | DO 0282 | | | | SITE 00002 | MUGU_005 | | | |
| 139 | | NAVFAC - | | | SITE 00003 | | | | |
| | | SOUTHWEST | | | SITE 00004 | | | | |
| | | DIVISION | | | SITE 00005 | | | | |
| | | | | | SITE 00006 | | | | |
| | | | | | SITE 00008 | | | | |
| | | | | | SITE 00009 | | | | |
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| | | | | | SITE 00026 | | | | |
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| | | | | | SITE 00036 | | | | |
| | | | | | SITE 00037 | | | | |
| | | | | | UST 000023 | | | | |
| | | | | | UST 000055 | | | | |

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| N63126 / 000623 | 10-08-1999 | M. ALONZO | COMMENTS REGARDING THE DRAFT FINAL | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 BX 0013 | |
| | 11-16-1999 | DTSC | WORK PLAN PLUME DELINEATION AND | | | | 30109727 | |
| CORRESPONDENCE | 5090.3.A. | S. MURPHY | HYDROGEOLOGIC CHARACTERIZATION | | | IMAGED | | |
| NONE | NONE | NAVFAC - | FOR TRIHALOMETHANE REMEDIATION | | | MUGU_004 | | |
| 2 | | SOUTHWEST | | | | | | |
| | | DIVISION | | | | | | |
| N63126 / 000631 | 11-03-1999 | S. MURPHY | ADDENDUM V.1 ORGANIZATIONAL | ADMIN RECORD | SITE 00005 | NAVFAC | | |
| NONE | 01-24-2000 | NAVFAC - | CHANGES AND ADDITIONAL | | | SOUTHWEST - BLDG. | | |
| MISC | 5090.3.A. | SOUTHWEST | ELECTROKINETIC TEST SYSTEM | | | 1 | | |
| NONE | NONE | DIVISION | PROPOSED FOR THE TECHNOLOGY | | | | | |
| 25 | | M. ALONZO | DEMONSTRATION PLAN | | | | | |
| | | DTSC CYPRESS | | | | | | |
| N63126 / 000630 | 12-07-1999 | M. ALONZO | COMMENTS ON REVIEW OF SITE 5 | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 BX 0013 | |
| NONE | 01-24-2000 | DTSC - CYPRESS, | BIOSCREEN INPUT SCREEN AND | | | | 30109727 | |
| CORRESPONDENCE | 5090.3.A. | CA | CENTERLINE OUTPUT FOR | | | IMAGED | | |
| NONE | NONE | S. MURPHY | TRISHALOMETHANE CONTAMINATION | | | MUGU_003 | | |
| 4 | | NAVFAC - | | | | | | |
| | | SOUTHWEST | | | | | | |
| | | DIVISION | | | | | | |
| N63126 / 000629 | 12-16-1999 | S. MURPHY | RESPONSE TO COMMENTS ON REVIEW OF | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 BX 0013 | |
| NONE | 01-24-2000 | NAVFAC - | SITE 5 BIOSCREEN INPUT SCREEN AND | | | | 30109727 | |
| MISC | 5090.3.A. | SOUTHWEST | CENTERLINE OUTPUT FOR | | | IMAGED | | |
| NONE | NONE | DIVISION | TRISHALMETHANE CONTAMINATION | | | MUGU_003 | | |
| 1 | | M ALONZO | | | | | | |
| | | DTSC CYPRESS | | | | | | |
| N63126 / 000669 | 01-01-2000 | | DRAFT FINAL - IN-SITU ELECTROKINETIC | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 BX 0014 | |
| SFIM-AEC-ET-CR- | 10-23-2000 | US ARMY | REMEDATION FOR METAL CONTAMINATED | BASE | | | 30109727 | |
| 99021 | 5090.3.A. | ENVIRONMENTAL | SOILS AT THE OLD AREA 6 SHOPS | | | IMAGED | | |
| REPORT | NONE | CENTER | | | | MUGU_004 | | |
| NONE | | NAVFAC - | | | | | | |
| 444 | | SOUTHWEST | | | | | | |
| | | DIVISION | | | | | | |

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| N63126 / 000668 NONE REPORT N47408-95-D-0730 187 | 03-10-2000 10-23-2000 5090.3.A. DO099 | CHEN, A. BATTELLE NAVFAC - SOUTHWEST DIVISION | DRAFT REPORT - PLUME DELINEATION AND HYDROGEOLOGIC CHARACTERIZATION FOR TRICHALOMETHANE REMEDIATION | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0014 30109727 | |
| N63126 / 000654 NONE CORRESPONDENCE N62474-94-D-7609 133 | 04-01-2000 10-19-2000 5090.3.A. 00282 | DOBREI, C. TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION | FINAL COMMUNITY RELATIONS PLAN | ADMIN RECORD BASE | 018 020 022 023 024 026 028 030 031 032 036 037 BLDG. 182 BLDG. 311 SITE 00001 SITE 00002 SITE 00003 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 SITE 00013 SITE 00014 SITE 00015 SITE 00016 SITE 00017 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0013 30109727 | |

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| N63126 / 000673 DS.0376.16967 REPORT N62474-94-D-7609 6 | 03-08-2001 03-14-2001 5090.3.A. 00376 | K. NORRIS TETRA TECH EM INC. M. GONZALES NAVFAC - SOUTHWEST DIVISION | MONTHLY PROGRESS REPORT FOR ENVIRONMENTAL CLEANUP EFFORTS - JANUARY 2001 | ADMIN RECORD BASE | 020 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0014 30109727 |
| N63126 / 000674 DS.0376.16968 REPORT N62474-94-D-7609 6 | 03-30-2001 04-11-2001 5090.3.A. 00376 | K. NORRIS TETRA TECH EM INC. M. GONZALES NAVFAC - SOUTHWEST DIVISION | MONTHLY PROGRESS REPORT FOR ENVIRONMENTAL CLEANUP EFFORTS - FEBRUARY 2001 | ADMIN RECORD BASE | 020 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0014 30109727 |
| N63126 / 000676 DS.0376.16975 REPORT N62474-94-D-7609 5 | 05-01-2001 06-13-2001 5090.3.A. 00376 | TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION | MONTHLY PROGRESS REPORT FOR ENVIRONMENTAL CLEANUP EFFORTS - MAY 2001 | ADMIN RECORD BASE | 020 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_001 | 181-07-0019 BX 0014 30109727 |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s)—— |
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| N63126 / 000691 DS.0376.16974 REPORT N62474-94-D-7609 5 | 05-08-2001 04-25-2003 5090.3.A. 00376 | K. NORRIS TETRA TECH EM INC. M. GONZALES NAVFAC - SOUTHWEST DIVISION | MONTHLY PROGRESS REPORT FOR MARCH AND APRIL 2001 | ADMIN RECORD BASE | 020 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0015 30109727 |
| N63126 / 000681 DS.0149.17191 MEMO N62474-94-D-7609 171 | 08-24-2001 09-04-2001 5090.3.A. 00149 | K. NORRIS TETRA TECH EM INC. M. GONZALEZ NAVFAC - SOUTHWEST DIVISION | DRAFT RISK TO VERTEBRATES - TECHNICAL MEMORANDUM (INCLUDES TRANSMITTAL LETTER TO REGULATORS) | ADMIN RECORD BASE | SITE 00001 SITE 00005 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0014 30109727 |
| N63126 / 000104 CTO-0022/0019 CORRESPONDENCE N68711-95-D-7526 299 | 10-24-2001 10-30-2001 5090.3.A. 00022 | S. DONOVAN BECHTEL NATIONAL, INC. NAVFAC - SOUTHWEST DIVISION | DRAFT WORK PLAN FOR PHASE II GROUNDWATER INVESTIGATION AT FORMER PLATING-WASTE PITS | ADMIN RECORD BASE | SITE 00005 | FRC - PERRIS IMAGED MUGU_004 | 181-07-0019 BX 0003 30109727 |
| N63126 / 000303 DS.0149.17172 MISC N62474-94-D-7609 38 | 12-21-2001 01-02-2002 5090.3.A. 00149 | K. NORRIS TETRA TECH EM INC. M. GONZALES NAVFAC - SOUTHWEST DIVISION | RESPONSES TO REGULATORY AGENCY COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION FOR GROUNDWATER | ADMIN RECORD BASE | 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0006 30109727 |

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| N63126 / 000409 | 01-01-2002 | | RESTORATION ADVISORY BOARD (RAB) | ADMIN RECORD | 024 | FRC - PERRIS | 181-07-0019 | BX 0008 | |
| NONE | 02-12-2002 | NBVC PT. MUGU | NEWSLETTER - ISSUE 8 | BASE | SITE 00005 | | 30109727 | | |
| MISC | 5090.3.A. | | | | SITE 00006 | IMAGED | | | |
| NONE | NONE | RESTORATION ADVISORY BOARD | | | | MUGU_005 | | | |
| 1 | | | | | | | | | |
| N63126 / 000072 | 01-24-2002 | S. DONOVAN | FINAL WORK PLAN FOR PHASE II | ADMIN RECORD | BLDG. 71 | FRC - PERRIS | 181-07-0019 | BX 0003 | |
| CTO-0022/0035 | 02-04-2002 | BECHTEL | GROUNDWATER REMEDIAL | BASE | SITE 00005 | | 30109727 | | |
| CORRESPONDENCE | 5090.3.A. | NATIONAL, INC. | INVESTIGATION AT FORMER PLATING- | | | IMAGED | | | |
| N68711-95-D-7526 | 00022 | | WASTE PITS | | | MUGU_005 | | | |
| 310 | | NAVFAC - SOUTHWEST DIVISION | | | | | | | |
| N63126 / 000441 | 02-15-2002 | K. NORRIS | DRAFT SAMPLING AND ANALYSIS PLAN | ADMIN RECORD | SITE 00005 | FRC - PERRIS | 181-07-0019 | BX 0008 | |
| DS.0149.17193 AND | 03-05-2002 | TETRA TECH EM | (FIELD SAMPLING PLAN/QUALITY | | SITE 00011 | | 30109727 | | |
| SWDIV SER | 5090.3.A. | INC. | ASSURANCE PROJECT PLAN) FOR | | | IMAGED | | | |
| 5DEN.MG/2019 | 00149 | M. GONZALES | ECOLOGICAL FIELD ACTIVITIES AT THE | | | MUGU_005 | | | |
| CORRESPONDENCE | | NAVFAC - | OLD 6 AREAS SHOPS AND THE MUGU | | | | | | |
| N62474-94-D-7609 | | SOUTHWEST | LAGOON & DRAINAGE DITCHES | | | | | | |
| 146 | | DIVISION | | | | | | | |
| N63126 / 000443 | 03-01-2002 | K. NORRIS | FINAL SITE MANAGEMENT PLAN | ADMIN RECORD | 020 | NAVFAC | | | |
| DS.0376.15078 | 04-02-2002 | TETRA TECH EM | | BASE | 024 | SOUTHWEST - BLDG. | | | |
| CORRESPONDENCE | 5090.3.A. | INC. | | | SITE 00001 | 1 | | | |
| N62474-94-D-7609 | 00376 | M. GONZALES | | | SITE 00002 | | | | |
| 200 | | NAVFAC - | | | SITE 00003 | | | | |
| | | SOUTHWEST | | | SITE 00004 | | | | |
| | | DIVISION | | | SITE 00005 | | | | |
| | | | | | SITE 00006 | | | | |
| | | | | | SITE 00007 | | | | |
| | | | | | SITE 00008 | | | | |
| | | | | | SITE 00009 | | | | |
| | | | | | SITE 00010 | | | | |
| | | | | | SITE 00011 | | | | |

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| N63126 / 000487 NONE MISC NONE 3 | 04-01-2002 05-08-2002 5090.3.A. NONE | RESTORATION ADVISORY BOARD NAVFAC - SOUTHWEST DIVISION | RESTORATION ADVISORY BOARD (RAB) NEWSLETTER - ISSUE 9 | ADMIN RECORD BASE | 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0010 30109727 |
| N63126 / 000483 CTO-0022/0047 AND SWDIV SER 5DEN.MG/2047 MEMO N68711-95-D-7526 22 | 04-22-2002 04-25-2002 5090.3.A. 00022 | S. DONOVAN BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION | TECHNICAL MEMORANDUM - EVALUATION OF GROUNDWATER BENEFICIAL USE DESIGNATIONS (INCLUDES SWDIV TRANSMITTAL LETTER TO REGULATORS) {SEE AR #578 - RESPONSE TO COMMENTS & #581 - REVISED MEMO} | ADMIN RECORD BASE | 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000551 NONE REPORT N47408-95-D-0370 2000 | 05-16-2002 05-06-2003 5090.3.A. DO 0099 | CHEN, A. BATTELLE NAVFAC - SOUTHWEST DIVISION | DRAFT NAVAL FACILITIES ENGINEERING COMMAND PHASE II REMEDIAL INVESTIGATION REPORT AT SITE 5 - MODIFICATION 02 | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000578 CTO-0022/0062 MISC N68711-95-D-7526 8 | 08-29-2002 09-06-2002 5090.3.A. 00022 | BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION | RESPONSES TO RWQCB COMMENTS ON THE TECHNICAL MEMORANDUM - EVALUATION OF GROUNDWATER BENEFICIAL USE DESIGNATIONS (SEE AR #483 - TECH MEMO) | ADMIN RECORD BASE | SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0012 30109727 |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s) — |
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| N63126 / 000580 CTO-0022/0064 REPORT N68711-95-D-7526 400 | 09-10-2002 09-17-2002 5090.3.A. 00022 | S. DONOVAN BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION | DRAFT PHASE II GROUNDWATER REMEDIAL INVESTIGATION REPORT AT THE FORMER PLATING-WASTE PITS (SEE AR #727 - REVISED DRAFT PHASE II GROUNDWATER REMEDIAL INVESTIGATION REPORT) | ADMIN RECORD BASE | BLDG. 6-31 BLDG. 71 SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000581 CTO-0022/0065 & 0065-1 AND SWDIV SER 5DEN.MG/2047 MEMO N68711-95-D-7526 300 | 10-08-2002 10-16-2002 5090.3.A. 00022 | S. DONOVAN BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION | REVISED TECHNICAL MEMORANDUM EVALUATION OF GROUNDWATER BENEFICIAL USE DESIGNATIONS [INCLUDES SWDIV TRANSMITTAL LETTER FROM M. GONZALES] (SEE AR #483 - ORIGINAL MEMO) | ADMIN RECORD BASE | 024 SITE 00001 SITE 00002 SITE 00004 SITE 00005 SITE 00006 SITE 00008 SITE 00009 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000049 DS.A007.10614 REPORT N68711-00-D-0005 600 | 04-28-2003 05-05-2003 5090.3.A. DO 007 | K. NORRIS TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION | DRAFT ECOLOGICAL RISK ASSESSMENT ADDENDUM | ADMIN RECORD BASE | SITE 00005 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000692 NONE MISC NONE 3 | 06-01-2003 06-10-2003 5090.3.A. NONE | RESTORATION ADVISORY BOARD NAVFAC - SOUTHWEST DIVISION | RESTORATION ADVISORY BOARD (RAB) NEWSLETTER, ISSUE 13 AND 05 JUNE 2003 MEETING AGENDA | ADMIN RECORD BASE | 019 024 SITE 00005 SITE 00006 | FRC - PERRIS IMAGED MUGU_005 | 181-07-0019 BX 0015 30109727 |
| N63126 / 000695 NONE REPORT N68711-01-D-6005 200 | 07-01-2003 08-20-2003 5090.3.A. 00001 | T. GARVEY TN & ASSOCIATES NAVFAC - SOUTHWEST DIVISION | DRAFT PILOT STUDY CLOSURE REPORT ELECTROKINETIC REMEDIATION PILOT STUDY, IR SITE 5 | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |

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| N63126 / 000703 CTO-0022/0106 MISC N68711-95-D-7526 30 | 12-11-2003 01-12-2004 5090.3.A. 00022 | J. LEAR BECHTEL ENVIRONMENTAL, INC. VARIOUS AGENCIES | RESPONSE TO COMMENTS ON THE DRAFT PHASE II GROUNDWATER REMEDIAL INVESTIGATION REPORT FOR THE FORMER PLATING WASTE PITS AT INSTALLATION RESTORATION SITE 5 AND APPENDIX G | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000709 DS.A007.10615 MISC N68711-00-D-0005 35 | 04-01-2004 05-05-2004 5090.3.A. DO 007 | K. NORRIS TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION | RESPONSES TO CALIFORNIA DEPARTMENT OF FISH AND GAME COMMENTS ON THE DRAFT ECOLOGICAL RISK ASSESSMENT ADDENDUM FOR INSTALLATION RESTORATION (IR) PROGRAM [SEE AR #49 - DRAFT ADDENDUM] | ADMIN RECORD BASE | SITE 00005 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000713 DS. B026.14092 CORRESPONDENCE N68711-03-D-5104 38 | 05-01-2004 05-20-2004 5090.3.A. 00026 | SULTECH NAVFAC - SOUTHWEST DIVISION | DRAFT HEALTH AND SAFETY PLAN FOR GROUNDWATER MONITROING | ADMIN RECORD BASE | 024 SITE 00001 SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000717 TC. A007.10248 MM N68711-00-D-0005 7 | 06-17-2004 07-12-2004 5090.3.A. DO 0007 | NAVFAC - SOUTHWEST DIVISION | SUMMARY OF MEETING TO DISCUSS CALIFORNIA DEPARTMENT OF FISH AND GAME (CDFG) COMMENTS ON THE DRAFT ECOLOGICAL RISK ASSESSMENT ADDENDUM FOR INSTALLATION RESTORATION | ADMIN RECORD BASE | SITE 00005 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000721 DS.B026.14095 CORRESPONDENCE N68711-03-D-5104 60 | 07-01-2004 08-05-2004 5090.3.A. 00026 | G. SWANSON SULTECH NAVFAC - SOUTHWEST DIVISION | FINAL ADDENDUM TO FINAL SAMPLING AND ANALYSIS PLAN (SAP) (FIELD SAMPLING PLAN/QUALITY ASURANCE PROJECT PLAN) FOR GROUNDWATER CHARACTERIZATION, SUPPLEMENTAL GROUNDWATER INVESTIGATION | ADMIN RECORD BASE | 024 SITE 00001 SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |

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| N63126 / 000730 DS.B02619570 REPORT N68711-03-D-5104 200 | 01-01-2005 02-02-2005 5090.3.A. 00026 | M. FOSTER SULTECH NAVFAC - SOUTHWEST DIVISION | DRAFT GROUNDWATER MONITORING SUMMARY REPORT FOR INSTALLATION RESTORATION PROGRAM (IRP) | ADMIN RECORD BASE | 024 SITE 00001 SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000727 CTO-0022/0125, 0125-1, 0125-2, 0125-3 REPORT N68711-95-D-7526 450 | 04-18-2005 12-28-2004 5090.3.A. 00022 | J. LEAR BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST DIVISION | FINAL PHASE II GROUNDWATER REMEDIAL INVESTIGATION REPORT, FORMER PLATING-WASTE PITS [INCLUDES REPLACEMENT PAGES (REV. 1) CONVERTING THE REVISED DRAFT DATED DECEMBER 2004 INTO FINAL] (SEE AR #580 - DRAFT PHASE II GROUNDWATER REMEDIAL INVESTIGATION REPORT) | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000735 DS.A007.10615-1 REPORT N68711-00-D-0005 50 | 07-07-2005 07-19-2005 5090.3.A. 00007 | TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION | RESPONSES TO REGULATORY AGENCY COMMENTS ON THE DRAFT ECOLOGICAL RISK ASSESSMENT ADDENDUM FOR INSTALLATION RESTORATION PROGRAM (IRP) SITES | ADMIN RECORD BASE | SITE 00005 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000737 DS. B026. 19573 REPORT N68711-03-D-5104 350 | 09-01-2005 11-01-2005 5090.3.A. CTO 0026 | K. NORRIS SUL TECH NAVFAC - SOUTHWEST DIVISION | FINAL GROUNDWATER MONITORING SUMMARY REPORT | ADMIN RECORD BASE | 024 SITE 00001 SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000747 DS.A007.10618 REPORT N68711-00-D-0005 600 | 12-20-2005 02-14-2006 5090.3.A. DO 007 | K. NORRIS TETRA TECH EM INC. NAVFAC - SOUTHWEST DIVISION | FINAL ECOLOGICAL RISK ASSESSMENT ADDENDUM [CD COPY ENCLOSED] | ADMIN RECORD BASE | SITE 00005 SITE 00011 | NAVFAC SOUTHWEST - BLDG. 1 | |

| UIC No. / Rec. No. Doc. Control No. Record Type Contract No. Approx. # Pages | Record Date Prc. Date SSIC No. CTO No. | Author Author Affil. Recipient Recipient Affil. | Subject | Distribution | Sites | Location SWDIV Box No(s) CD No. | FRC Accession No. FRC Warehouse FRC Box No(s)—— |
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| N63126 / 000827 NONE REPORT N62472-02-D-1300 180 | 01-01-2006 10-14-2008 5090.3.A. NONE | BENNETT, J. MALCOLM PIRNIE, INC. NAS POINT MUGU | FINAL PRELIMINARY ASSESSMENT (SEE RECORD # 828 - FINAL PRELIMINARY ASSESSMENT ADDENDUM) [FLAG AS MRP IN NIRIS] | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000761 CTO-0022/172 REPORT N68711-95-D-7526 150 | 11-27-2006 11-29-2006 5090.3.A. 00022 | HEIRONIMUS, T. BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST | DRAFT FOCUSED FEASIBILITY STUDY (FS) REPORT FOR WETLANDS SEDIMENT [INCLUDES PAGES ISSUED 28 NOVEMBER 2006: REVISED CONTRACTOR'S TRANSMITTAL AND MISSING PAGE 2 OF APPENDIX B, ATTACHMENT A2.] {SEE COMMENTS.} | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000779 NONE PUB NOTICE NONE 1 | 07-11-2007 07-11-2007 5090.3.A. NONE | NBVC POINT MUGU PUBLIC INTEREST | 18 JULY 2007 RESTORATION ADVISORY BOARD MEETING AGENDA | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000780 NONE PUB NOTICE NONE 4 | 07-11-2007 07-11-2007 5090.3.A. NONE | NBVC POINT MUGU PUBLIC INTEREST | SUMMER 2007 INSTALLATION RESTORATION PROGRAM NEWSLETTER - CLEANUP AND AMBIENT POLLUTION STUDY | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |
| N63126 / 000814 BEI-7526-0022-0196 REPORT N68711-95-D-7526 400 | 06-01-2008 08-04-2008 5090.3.A. 00022 | HEIRONIMUS, T. BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST | FINAL FOCUSED FEASIBILITY STUDY REPORT FOR WETLANDS SEDIMENT (CD COPY ENCLOSED) | ADMIN RECORD BASE | SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | |

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| N63126 / 000811 NONE CORRESPONDENCE NONE 4 | 06-02-2008 06-02-2008 5090.3.A. NONE | RAB MEMBERS NAVFAC - SOUTHWEST | WINTER 2008 NEWSLETTER, INSTALLATION RESTORATION PROGRAM (IRP) [DOCUMENT PERTAINS TO MULTIPLE BASES] | ADMIN RECORD BASE | SITE 00005 SITE 00006 SITE 00024 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| N63126 / 000817 BEI-7526-0022-0199 REPORT N68711-95-D-7526 1000 | 07-01-2008 09-17-2008 5090.3.A. 00022 | LEAR, J. BECHTEL ENVIRONMENTAL, INC. NAVFAC - SOUTHWEST | DATA REPORT, FORMER PLANTING WASTE PITS (INCLUDES ANALYTICAL DATA AND CD COPY) | ADMIN RECORD BASE | BLDG 00071 BLDG 00311 BLDG 06-15 BLDG 06-20 BLDG 06-29 BLDG 06-31 BLDG 06-32 BLDG 06-33 BLDG 06-58 BLDG 06-85 SITE 00005 | NAVFAC SOUTHWEST - BLDG. 1 | | |
| N63126 / 000849 NONE PUBLIC NOTICE NONE 4 | 11-01-2009 12-01-2009 5090.3.A. NONE | NAVFAC - SOUTHWEST PUBLIC INTEREST | NOVEMBER 2009 NEWSLETTER, INSTALLATION RESTORATION PROGRAM (IRP) [DOCUMENT PERTAINS TO MULTIPLE BASES] | ADMIN RECORD BASE-READY | SITE 00001 SITE 00005 SITE 00006 SITE 00009 SITE 00014 SITE 00024 SITE 00035 UST 000002 UST 000021 UST 000024 UST 000161 | NAVFAC SOUTHWEST - BLDG. 1 | | |

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Total - Administrative Records: 126

[UIC NUMBER]='N63126'

No Keywords

Sites=SITE 00005

No Classification

APPENDIX G

FACT SHEETS



AUGUST 2010

FACT SHEET

NAVAL BASE VENTURA COUNTY, POINT MUGU INSTALLATION RESTORATION PROGRAM SITE 5 OLD AREA 6 SHOPS

NON-TIME CRITICAL REMOVAL ACTION

Naval Base Ventura County (NBVC) Environmental Division invites the public to comment on the proposed environmental investigation and cleanup activities addressing contaminated soils at Installation Restoration (IR) Program Site 5, Old Area 6 Shops at NBVC, Point Mugu. A brief description of the proposed removal action alternative is provided in this fact sheet.

Nearby residents and interested parties are encouraged to comment on the proposed Removal Action during the 30-day comment period beginning August 6, 2010 and ending 4 September 2010. A copy of the Navy document, Draft Final Action Memorandum (DFAM) is available for review at the NBVC Port Hueneme information repository or you can request a CD copy by contacting:

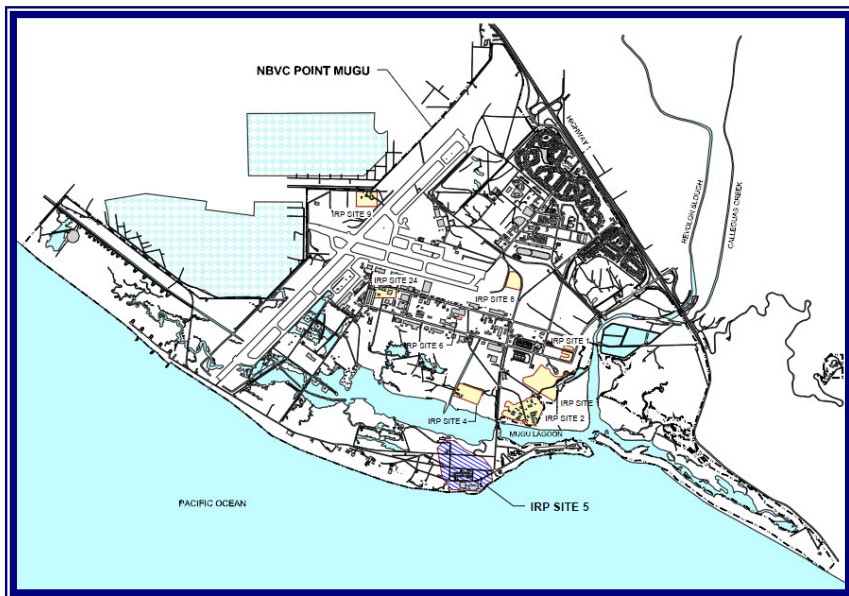
Mr. Steve Granade at (805) 989-3806
steve.granade.navy.mil

The California Department of Toxics Substances Control (DTSC) has conducted its own independent environmental assessment. To request a copy of the Draft DTSC document, contact:

Mr. Peter Chen at (714) 484-5431
pchen@dtsc.ca.gov

BACKGROUND INFORMATION

NBVC Point Mugu covers approximately 4,500 acres and supports 897 buildings, including 568 housing units. Many of the buildings were constructed on dredged material and other fill. The Navy established temporary operations at Point Mugu in 1943 and has conducted operations there since 1944. In 1946, the Naval Air Missile Test Center was commissioned and, in 1949, the U.S. Naval Air Station was



NBVC POINT MUGU LOCATION MAP

commissioned. Congress appropriated funding for a permanent Navy site at Point Mugu in 1947. The Pacific Missile Test Range was established in 1957 and was renamed Pacific Missile Test Center in the mid-1970s. In 1993, the names were revised again. The Pacific Missile Test Center became Naval Air Warfare Center Weapons Division, and the U.S. Naval Air Station became Naval Air Weapons Station (NAWS) Point Mugu. In 1998, NAWS Point Mugu was renamed Naval Air Station (NAS) Point Mugu. As part of regionalization of Ventura County's Navy bases, Naval Construction Battalion Center Point Hueneme and NAS Point Mugu were consolidated administratively under NBVC on 01 October 2000. The aviation mission and base operating support were consolidated under the NBVC command. On 16 October 2006, NAS Point Mugu was renamed NBVC Point Mugu.

This Fact Sheet Describes:

- The IR Program
- The status and progress of environmental investigation and cleanup activities at IR Program Site 5
- Community Outreach

Public Meeting

Date: August 18, 2010

Time: 6:00PM to 7:00PM

**Place: Orvene Carpenter
Community Center
550 Park Road
Port Hueneme, CA. 93041**

ADDITIONAL INFORMATION/CONTACTS

Teri Reid (805) 989-9234
Public Affairs Officer (PAO), NBVC

Peter Chen (714) 484-5431
Site Remediation Manager, DTSC

Peter Raftery (213) 576-6796
Regional Water Quality Control Board





IR PROGRAM SITE 5

IR PROGRAM SITE 5 HISTORY

Between 1947 and 1978, wastes associated with laboratory and shop operations were disposed at IR Program Site 5. Documented discharge locations included a slough, located just north of Beach Road across from Building 6-31, and former plating waste pits. The waste types associated with laboratory and shop operations consisted of organic solvents, rocket fuels, plating rinsate (reportedly contained high concentrations of cyanide and various metals including chromium, copper, zinc and tin), and miscellaneous laboratory chemicals. In addition, an 8 inch sewer effluent line running north-south through the eastern portion of IRP Site 5 was discovered during a 1991 site visit. The effluent material was historically discharged to Mugu Lagoon; the origin of the line has not been identified with certainty.

DEVELOPMENT OF REMOVAL ACTION ALTERNATIVES:

The soil removal action alternatives were developed in the Engineering Evaluation/Cost Analysis (EE/CA) prepared to address non-time-critical removal action (NTCRA) alternatives for wetland sediment contamination at IR Program Site 5, the Old Area 6 Shops, located at NBVC Point Mugu. The EE/CA was prepared by the Navy in conjunction with the California Department of Toxics Substances Control (DTSC) and the Regional Water Quality Control Board-Los Angeles Region (RWQCB) and carried out in accordance with all Federal, state and local laws. The primary federal laws are the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (U.S. EPA 1993) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300.415).

The purpose of the EE/CA was to identify and analyze removal action alternatives to address ecological risks to birds (i.e. song sparrow and light-footed clapper rail) and small mammals (i.e. deer mouse) from chemicals of concern (COCs; i.e. cadmium, chromium, copper, lead, nickel, or silver) in wetland sediment at the IR Program Site 5. Also, because the wetland sediment at IR Program Site 5 is adjacent to Mugu Lagoon and is connected to Mugu Lagoon by a tidal creek, the alternatives should ensure that the wetland sediment at IR Program Site 5 is not a source of non-protective levels of chromium to Mugu Lagoon. Three alternatives were identified and considered:

Alternative 1 – No Action

Alternative 2 – Institutional Controls

Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal

Each of these alternatives was evaluated to assess the following criteria:

- *Effectiveness to achieve the removal action objective (RAO). To reduce imminent risk to birds and small mammals by preventing exposure to sediment containing cadmium, chromium, copper, lead, nickel, or silver at concentrations that are not protective and to prevent ingestion of prey that has accumulated these constituents from sediment.*
- *Compliance with applicable or relevant and appropriate requirements.*
- *Implementability including technical and administrative feasibility.*
- *Cost-effectiveness.*

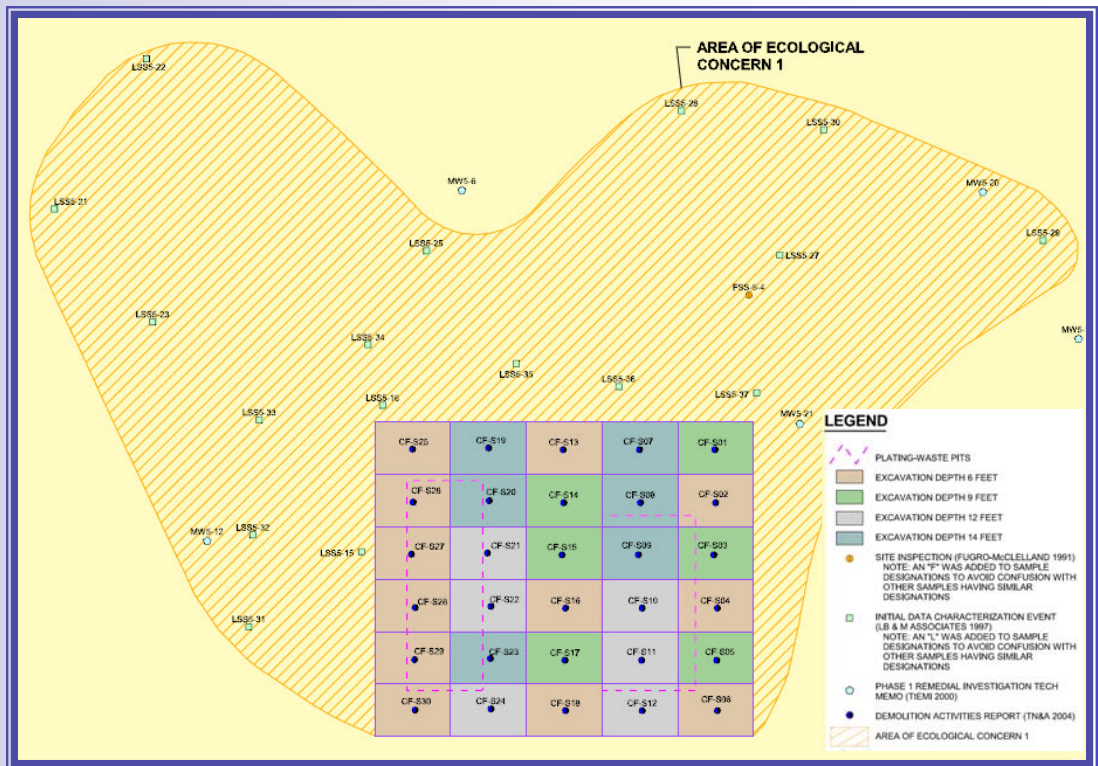


LIGHT-FOOTED CLAPPER RAIL

Based on this analysis, the Department of the Navy recommended Alternative 3 – Excavation of Sediment with Off-Site Treatment and Disposal. This alternative will reduce toxicity, mobility, and volume of contaminated sediment at the site, providing long-term effectiveness and protection to the environment. This alternative meets the removal action objectives and provides the best balance between costs and overall effectiveness. In addition, this alternative is intended to be consistent with the final remedy response action for the site.

DESCRIPTION OF SELECTED REMOVAL ACTION ALTERNATIVE

Based on analytical results from previous investigations, residual or confirmation sampling results, reported excavation limits of the emergency removal action, and the Electrokinetic (EK) pilot study decommissioning effort, it has been determined that the current site COCs concentrations exceed the sediment management objectives for cadmium, chromium, copper, lead, nickel, and silver at some sampling locations. These sampling locations are near the former plating-waste pits, within approximately 100 feet of the EK decommissioning excavation, and the area encompassing these sampling locations is designated as Area of Ecological Concern (AOEC).



AREA OF ECOLOGICAL CONCERN 1

The proposed removal action would involve excavation of 2,700 bank cubic yards (bcy) of COC-impacted sediment at Area of Ecological Concern 1 at IR Program Site 5 to an average depth of approximately 6 feet below ground surface, dewatering and chemical profiling of the excavated sediment, loading and transporting the impacted sediment to the landfill(s), and backfilling the excavation. This alternative would attain the RAOs for the IRP Site 5. Removal of the contaminated sediment would effectively minimize potential risks or other impacts to the environment.

This NTCRA is anticipated to be an interim step until acceptable levels have been defined and the results of this removal action can be compared to those levels. If sediment concentrations in portions or all of the removal action area do not meet the acceptable levels, further removal action may be required.

At the completion of removal actions at IRP Site 5, the Navy in cooperation with the California Department of Fish and Game, will reconstitute the excavated areas to pre-existing wetland habitat. The backfill will be designed and constructed with clean sediment similar to the physical composition of the surrounding sediment bed, with the intent that the wetland ecological community would recolonize the excavated area.

INSTALLATION RESTORATION PROGRAM AND COMMUNITY INVOLVEMENT:

Since the late-1980s, numerous investigations have been conducted at NBVC Point Mugu under the Navy's IR Program. The IR Program is a comprehensive environmental investigation and cleanup program that identifies, investigates, and remediates contaminated media, including soil and groundwater. The IR Program complies with the CERCLA and other federal and state laws that govern environmental investigations and cleanups. Activities performed under the IR Program, including selection of the final remedies documented in RODs, are reviewed and concurred upon by the U.S. EPA, DTSC, and the RWQCB.

In addition to multi-agency involvement, CERCLA includes a significant public participation component. The Navy encourages the public to gain an understanding of the on-going environmental investigations and cleanups at NBVC Point Mugu by visiting the information repository, reviewing the relevant records contained in the Administrative Record file, and attending Restoration Advisory Board (RAB) meetings. RAB meetings are held quarterly, typically on the third Wednesday of the month in Ventura County. If you would like to be put on the mailing list to receive information about environmental restoration activities at NBVC, please contact:

Mr. Steve Grenade
Environmental Division
Naval Base Ventura County
311 Main Road, Suite #1
Point Mugu, CA 93042
(805) 989-3806.

If you prefer, you can email your request to steve.granade@navy.mil.

INSIDE...

Soil Cleanup Update for Installation Restoration Program Site 5 NBVC Point Mugu, California.



MAILING LIST COUPON

If you would like to receive further information, please fill out this coupon and mail it to :

Steven Granade
Restoration Advisory Board Administrator
311 Main Road, Suite 1, Code N45V
Point Mugu, California, 93042-5033

- ☐ Please send me information about the RAB
☐ Please add my name to the mailing list
☐ Por favor envíeme la información en español

- ☐ I'm interested in becoming a RAB member
☐ Please send me a copies of the previous newsletter

Name: _____
 Address: _____
 Phone: _____
 Organization: _____
 Email address: _____
 Comments: _____

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DEPARTMENT OF THE NAVY

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 Environmental Division
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